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ANNUAL REPORTS

OF THE

CHEMICAL LABORATORY

OF THE

AMERICAN MEDICAL ASSOCIATION

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VOLUME 7

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PART I. - - - - - - - - - REPRINTS OF CONTRIBUTIONS
PART II. - - - - - - - - - ABSTRACTS OF REPORTS
PART III. - - - - REPORTS NOT PREVIOUSLY PUBLISHED

PRESS OF
AMERICAN MEDICAL ASSOCIATION
FIVE HUNDRED AND THIRTY-FIVE NORTH DEARBORN STREET
CHICAGO

PREFACE

The scope of the work of the Chemical Laboratory of the American Medical Association has been described in previous volumes, but to prevent misapprehension it seems worth while to review its activities again here. The Laboratory was established primarily to aid the Association's Council on Pharmacy and Chemistry in determining the character and quality of the proprietary and unofficial medicaments offered to the medical profession. As a part of this duty, the Laboratory examines the various preparations which are proposed for inclusion in the Council's publication, "New and Nonofficial Remedies," and also other medicinal preparations regarding which it is deemed important that the medical profession be informed. Since its establishment in 1906, the sphere of the Laboratory's activities has constantly widened. Thus it supplies information on chemical topics to various departments of THE JOURNAL — Queries and Minor Notes and the Propaganda Department, for instance. In particular, it has devoted much time during recent years to the analysis of "patent medicines" and quack nostrums, thus furnishing material for the campaign of the Propaganda Department of THE JOURNAL in the interests of public health. It will therefore be seen that, while the scope of the Laboratory's work is wide, the field of its activities is distinctly defined.

The reports of the Laboratory are published in order that its findings may be readily available to those who are interested in the composition of medicines, namely, drug analysts, food and drug authorities, pharmacists, and others. The methods of analysis, when believed to be of interest, are reported in detail in the hope that this information may be of help to those engaged in drug analysis.

In the present volume considerable space is devoted to the analysis of "patent medicines," particularly the now widely exploited "obesity cures," including "Louisenbad Reduction Salt," "Get Slim," "Every Woman's Flesh Reducer." It is hoped that through these reports the public may become better informed as to the worthlessness of this class of quack nostrums. The analysis showing Pyoatoxin, referred to as "Pheno-Methylene-Formate," to be a mixture of hexamethylenamin and methylene blue is a reminder that simple mixtures masquerading as definite chemical compounds, though less common than formerly, are still to be met with. The need for the work of this Laboratory is further demonstrated by the reports on the composition of "Iodia," "Tri-Iodides," "Three Chlorides" and "Maizo-Lithium," showing that these products, which are widely advertised in medical and pharmaceutical publications and sold in every state of the Union, are marketed under misleading and false claims as to composition. The fact that the owners of Iodia have continued to label their product falsely in spite of the report by A. B. Lyon nearly thirty years ago indicates the need for greater publicity for findings of this sort, for a proper publicity of these findings would have forced the promoters to declare the composition of their product correctly, even if this publicity had failed to attract the attention of drug commissioners. Finally, the examination of "Podolax" and the contribution "The Detection of Emodin-Bearing Drugs in Presence of Phenolphthalein" will, it is hoped, be of aid to those engaged in the analysis of the phenolphthalein-bearing laxatives which are now so common.

CONTENTS

PAGE

Theobromin Sodium Salicylate Versus "Diuretin": The Economical Aspect. W. A. Puckner, Ph.D., and Paul N. Leech, Ph.D. 7
Podolax. L. E. Warren, Ph.C., B.S. 12
The Detection of Emodin-Bearing Drugs in Presence of Phenolphthalein. L. E. Warren, Ph.C., B.S. 19
Odor-O-No 25
Expurgo (Sanol) Anti-Diabetes 27
Case's Rheumatic Specific 30
Pyo-Atoxin 32
Louisenbad Reduction Salt 34
Get Slim 36
Every Woman's Flesh Reducer 38
Questionable Treatment of Mercuric Chlorid Poisoning. 39
Thoxos 41
Tonsiline 43
Citrolax 45
Pearl La Sage Complexion Treatment 47
Lower's Germen Prescription 50
Dr. Jiroch "Proof Treatment" 53
Angier's Emulsion 55
Iodia 58
Warner's Safe Remedy 60
Prunoids 63
Tri-Iodides, Three Chlorides and Maizolithium 65
Betul-Ol 74
Iodalia 75
Nourry Wine 77
Berledets 78
Dr. W. B. Caldwell's Syrup Pepsin and Herb Laxative Compound 80
Dunham's Specific 82
Elimiton (Hurwitt) 82
M. I. S. T. No. 2 Nerve Tonic 84
Nikola 87
Plasmon, Plasmon Powder and Plasmon Milk Powder .. 88
Worner's Oil Liniment 93
Index 95

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PART I

REPRINTS OF CONTRIBUTIONS FROM THE CHEMICAL LABORATORY OF THE AMERICAN MEDICAL ASSOCIATION

THEOBROMIN SODIUM SALICYLATE VERSUS "DIURETIN": THE ECONOMICAL ASPECT

W. A. Puckner, Phar.D., and Paul N. Leech, Ph.D.

(Reprinted, with additions, from The Journal A. M. A., April 4, 1914, p. 1108)

The following inquiry is from Dr. Reid Hunt, professor of pharmacology at Harvard Medical School:

> "Have you ever made an examination of the theobromin sodium salicylates on the market to determine if they are identical with 'Diuretin'? The description of theobromin sodium salicylate in New and Nonofficial Remedies agrees with the statements as to the composition of Diuretin, but I wondered if, at times at least, the theobromin sodium salicylate on the market might be a simple mixture of theobromin and sodium salicylate just as the Caffeinae Sodio-Salicylas, N. F., seems to be a simple mixture. Diuretin is quoted in current price-lists at $1.75 an ounce, whereas the price of theobromin sodium salicylate is only 35 cents an ounce. Many hospitals use Diuretin, and both physicians and students often have only hazy ideas as to what it is. If the preparations of theobromin sodium salicylate now on the market are identical with Diuretin they should certainly be used, not only because they are less expensive, but because the descriptive name will continually remind the physicians of what they are using."

Theobromin for some time has been regarded as a valuable therapeutic agent. The obstacle to its use has been its insolubility and the consequent uncertainty of the degree of its absorption. For this reason a soluble salt of theobromin, theobromin sodium salicylate, first introduced and advertised under the proprietary name "Diuretin," has come to be used to a considerable extent.

Theobromin sodium salicylate—also called theobromin and sodium salicylate—is prepared by interaction, in molecular proportions, of theobromin, sodium hydroxid and sodium salicylate, the theobromin first being treated with sodium hydroxid in the presence of a suitable solvent, then the sodium salicylate added and the whole brought to dryness. The soluble compound which is formed is generally considered to be a double salt of theobromin sodium and sodium salicylate.

Although theobromin salicylate is not controlled by patents of any kind, and although it is offered for sale under its chemical name by leading chemical manufacturers at from 35 to 45 cents per ounce, the proprietary product, Diuretin, sells for $1.75 an ounce. This is probably because the manufacturers think that those who have been using it under its chemically nondescriptive but therapeutically suggestive title, Diuretin, will remain ignorant of the fact that the same product is on the market under its chemical name. In view of these conditions, emphasized by Dr. Hunt's letter, it was deemed important to examine the market-supply of theobromin sodium salicylate and to compare the several specimens with the proprietary brand Diuretin.

Theobromin sodium salicylate is described in New and Nonofficial Remedies and in several foreign pharmacopeias. It is also to be described in the forthcoming United States Pharmacopeia.

The theobromin content prescribed for theobromin sodium salicylate by the various standards ranges from 45 to 50 per cent., that of New and Nonofficial Remedies being the highest. A requirement of not less than 46.5 per cent. of theobromin in the dried powder has been proposed for the next U. S. Pharmacopeia.

The methods of quantitative estimation laid down by the various authorities are all very similar and consist, in the main, of a determination of water, of the sodium hydroxid, free and in combination with theobromin, and of the theobromin itself. For the theobromin estimation the following method was employed:

A weighed sample (about 2 gm.) which had previously been dried, under slightly reduced pressure, over sulphuric acid, to constant weight, was dissolved in five times its weight of warm water. Two drops of phenolphthalein were added, and the solution titrated with normal hydrochloric acid. To the neutral solution, 1 drop of 10 per cent. ammonium hydroxid solution was added, and the mixture allowed to stand, with occasional stirring, for three and one-half hours at the temperature of 15 C. The precipitate was filtered on a weighed Gooch crucible, washed with just ten times the weight (of the original sample taken) of water (temperature 15 C.) and the precipitate dried at from 100 to 104. To the weight obtained, a correction factor (proved to be satisfactory by quantitative extraction experiments on the filtrate) of 0.13 gm. was added, for every 2 gm. of the original sample taken.[1]

Details of Analysis

The products examined and the details of examination are as follows:

"Diuretin Knoll," Knoll & Co.—The container of "Diuretin" was a colorless glass bottle with a ground glass stopper. The containers of all except one of the other samples were of brown glass, with cork stoppers. The contents of the 1-ounce bottle weighed 28.5 gm. The price of "Duretin" is $1.75 an ounce. "Diuretin" was a pure white powder and microscopic examination showed it *not* to be very crystalline. It contained 0.01 per cent. moisture. The alkalinity of the dried samples, calculated as sodium hydroxid, was 10.49 per cent. and 10.39 per cent. The theobromin content of the same samples was 48.54 per cent. and 48.69 per cent.

(*a*) 2.3739 gm. of the dried sample required 6.23 c.c. of normal hydrochloric acid; the theobromin weighed 0.9983 gm.

(*b*) 2.5119 gm. of the dried sample required 6.52 c.c. of normal hydrochloric acid; the theobromin weighed 1.0601 gm.

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[1] The filtrate from the dried sample, which had been treated as above, was extracted several times with chloroform, and the extract evaporated to dryness: (A) 2.3732 gm. of dried sample yielded a residue of theobromin which weighed 0.1565 gm.; (B) 1.8909 gm. of dried sample yielded a residue which weighed 0.1209 gm.

Theobromin and Sodium Salicylate, Mallinckrodt Chem. Works.—The contents of a 1-ounce bottle weighed 27.5 gm. It was a pure white powder and not very crystalline. The price was $0.35 an ounce. Theobromin and sodium salicylate, M. C. W., contained 1.89 per cent. moisture. The alkalinity of the dried sample, calculated as sodium hydroxid, was 9.95 per cent. and 9.96 per cent. The theobromin content of the same samples was 46.06 per cent. and 46.17 per cent., respectively.

(*a*) 1.8906 gm. of the dried sample required 4.70 c.c. of normal hydrochloric acid; the theobromin weighed 0.7486 gm.

(*b*) 2.2728 gm. of the dried sample required 5.66 c.c. of normal hydrochloric acid; the theobromin weighed 0.9020 gm.

This corresponds to 45.19 per cent. and 45.29 per cent. actual theobromin in the original sample.

Theobromin and Sodium Salicylate, Merck & Co.—The contents of the 1-ounce bottle weighed 29 gm. The price was $0.35 an ounce. It was a pure white powder, and under the microscope, quite crystalline. Theobromin and sodium salicylate, Merck, contained 0.48 per cent. moisture. The alkalinity of the dried specimen, calculated as sodium hydroxid, was 10.32 per cent. and 10.44 per cent. The theobromin content of the same samples was 47.54 per cent. and 48.09 per cent. respectively.

(*a*) 2.0484 gm. of the dried sample required 5.28 c.c. of normal hydrochloric acid; the theobromin weighed 0.8413 gm.

(*b*) 2.5256 gm. of the dried sample required 6.59 c.c. of normal hydrochloric acid; the theobromin weighed 1.0507 gm.

This corresponds to 47.31 per cent. and 47.85 per cent. actual theobromin in the original sample.

Theobromin and Sodium Salicylate, Powers-Weightman-Rosengarten Co.—The contents of the 1-ounce bottle weighed 29 gm. The price was $0.35 an ounce. It was a pure white powder and, under the microscope, fairly crystalline. Theobromin and sodium salicylate, P. W. R., contained 2.46 per cent. moisture. The alkalinity of the dried specimen, calculated as sodium hydroxid, was 10.34 and 10.33 per cent. The theobromin content was 47.65 per cent. and 47.49 per cent. respectively.

(*a*) 2.1322 gm. of the dried sample required 5.52 c.c. of normal hydrochloric acid; the theobromin weighed 0.8777 gm.

(*b*) 2.6378 gm. of the dried sample required 6.76 c.c. of normal hydrochloric acid.

(*c*) 2.0505 gm. of the dried sample gave a weight of 0.8406 gm. theobromin.

This corresponds to 46.47 per cent. and 46.32 per cent. actual theobromin in the original sample.

Theobromin and Sodium Salicylate "Roche," Hoffmann La Roche Chemical Works.—The contents of the 1-ounce bottle weighed 28.6 gm. The price was $0.35 an ounce. The powder was not white, but rather pink, due probably to some decomposition; the bottle was colorless, not brown. Under the microscope, the powder did not have a crystalline appearance. Theobromin and sodium salicylate, Roche, contained 2.27 per cent. moisture. The alkalinity of the dried specimen, calculated as sodium hydroxid, was 9.92 per cent. and 9.92 per cent. The theobromin content of the same sample was 48.97 per cent. and 49.13 per cent. respectively.

(*a*) 3.1369 gm. of the dried sample required 7.78 c.c. of normal hydrochloric acid; the theobromin weighed 1.3329 gm.

(*b*) 3.0207 gm. of the dried sample required 7.48 c.c. of normal hydrochloric acid; the theobromin weighed 1.2888 gm. This corresponds to 47.85 per cent. and 48.01 per cent. theobromin in the original samples.

Theobromin and Sodium Salicylate, Squibb.—The contents of the 1-ounce bottle weighed 26.8 gm. The price was $0.45 an ounce. It was a white powder, and very crystalline under the microscope. Theobromin and sodium salicylate, Squibb, contained 0.39 per cent. moisture. The alkalinity of the dried specimens, calculated as sodium hydroxid, was 9.98 per cent. and 9.95 per cent. The theobromin content of the same samples was 47.12 per cent. and 46.93 per cent., respectively.

(*a*) 2.5179 gm. of the dried sample required 6.26 c.c. of normal hydrochloric acid; the theobromin weighed 1.0235 gm.

(*b*) 2.0142 gm. of the dried sample required 5.00 c.c. of normal hydrochloric acid; the theobromin weighed 0.8066 gm. This corresponds to 46.93 per cent. and 46.33 per cent. theobromin in the original sample.

The results of the examination are compiled in the accompanying table:

The results show some variation in the moisture and also in the theobromin content of the dried specimens, but the variation is unimportant. The products in their original state (undried), as compared in relation to the theobromin content (the highest percentage of theobromin being 48.61, the lowest 45.24), reveal a variation of only about 3 per cent.—a variation which is negligible in the case of drugs such as theobromin.

From the preceding investigation, it is concluded that (1) practically there is no difference between the non-proprietary brands of "theobromin sodium salicylate" and "Diuretin"; (2) the several specimens examined were not simple mixtures of "theobromin" and "sodium salicylate"; (3) essentially all the brands complied with the standards laid down and can be rated as satisfactory; (4) "Diuretin," though sold at an exorbitant price, is not superior to the product supplied under the descriptive term "theobromin sodium salicylate," and (5) "Diuretin" sells wholesale for $1.75 an ounce, against 35 cents for the "theobromin sodium salicylate," and therefore its employment cannot be interpreted otherwise than as a useless and unnecessary expense.

SUMMARY OF ANALYSIS

	Physical Appearance*	Gm. in 1-Ounce Bottle	Price per Ounce	Moisture per Cent.	Alkalin. as NaOH on Dry Powder per Cent.†	Theobromin in Dry Powder per Cent.†	Theobromin in Orig. Specimen per Cent.†
Diuretin	3 Pure White	28.5	$1.75	0.01	10.44	48.61	48.61
Theo. Sod. Sal. M. C. W.	3 Pure White	27.5	0.35	1.89	9.95	46.11	45.24
Theo. Sod. Sal. Merck	1 Pure White	29.0	0.35	0.48	10.38	47.87	47.58
Theo. Sod. Sal. P. W. R. Co.	2 Pure White	29.1	0.35	2.46	10.30	47.57	46.39
Theo. Sod. Sal. Roche	3 Pink	28.6	0.35	2.27	9.92	49.05	47.92
Theo. Sod. Sal. Squibb	1 Pure White	26.8	0.45	0.39	9.97	46.82	46.63

* In this column, 1, 2 and 3 denote the following:
1. Quite crystalline, under microscope.
2. Fairly crystalline, under microscope.
3. Not crystalline, under microscope.

† Average of determinations.

PODOLAX

"Podophyllin with the Gripe Taken Out" Proved a Phenolphthalein Nostrum

L. E. Warren, Ph.C., B.S.

(Reprinted, with additions, from The Journal A. M. A., Aug. 15, 1914, p. 595)

"PoDoLax" is being extensively advertised as a laxative by the E. E. Sutherland Medicine Co. of Paducah, Ky. The claim is made that:

"PoDoLax is not an accidental discovery nor an Indian Remedy."

It is claimed that on the other hand:

"It is the result of hard study by the brightest minds in the medical profession. The pleasant taste is the effect of the work of a first-class chemist, so combining the drugs of the prescription as to eliminate the objectionable taste and at the same time retain their strength."

The name "PoDoLax" is apparently intended to suggest that podophyllum is the chief constituent of the remedy, and this implication is quite unmistakably conveyed in the following expression found in one of the advertisements for the preparation:

"PODOLAX

Podophyllin with the Gripe taken out."

Also in a circular devoted to the exploitation of PoDoLax and other nostrums the following statements are found:

"Now a new name is before the world, which is made up from the words 'Podophyllin' and 'Laxative.'

"'PoDoLax' is the word.

"'PoDo' from Podophyllin—

"'Lax' from Laxative or gentle rather than purgative.

"PoDoLax is Podophyllin with the gripe taken out. The only objection ever made to Podophyllin was the griping, and that is entirely overcome in PoDoLax.

"PoDoLax is humanity's oldest and best proven remedy, made pleasant.

"Mandrake is the Biblical term and is first mentioned in Genesis also in the songs of Solomon.

"Some of the doctors . . . still give Podophyllin because ever since the days of Jacob, Mandrake, as it was called in the Bible, has been the best of all to start the Bile.

"A harmless, never-failing, natural remedy, as pleasant to take as maple syrup. . . ."

Aside from these statements and the declaration on the label that PoDoLax contains 6 per cent. of alcohol, no information concerning the composition of the preparation is given. Since from its physical appearance it seemed improbable that the preparation could contain much resin of podophyllum it appeared worth while to examine a specimen of PoDoLax with the view of determining its laxative constituents.

The product is sold in 5-ounce panel containers which retail at fifty cents. The preparation examined was a dark brown, syrupy liquid having an aromatic, sweet taste and an odor like a mixture of anise, sassafras and wintergreen. It contained a considerable quantity of finely divided crystalline material in suspension. Some of this was separated by filtration, washed with water and identified as phenolphthalein by the usual tests. Another laxative substance was also present, which appeared to be an extract of senna. Large quantities of sugar (sucrose) were present. Small quantities each of alcohol, ammonium compounds, oil of wintergreen and possibly other volatile oils were also found. A determination of alcohol gave 4.47 per cent. by volume. The residue on drying amounted to about 71.5 gm. per hundred c.c. Podophyllin was absent or not present in more than traces. Phenolphthalein was determined and about 1.6 gm. per hundred c.c. found. This is equivalent to about 1.8 grain in each directed dose of PoDoLax. Whether or not other laxatives are present in small quantities matters little since phenolphthalein and senna are the essential medicinal ingredients, of which the former probably predominates. From the results of the examination it appears that PoDoLax is an aromatized syrup containing phenolphthalein in suspension and fortified by the addition of an extract of senna. Phenolphthalein is a synthetic compound made from coaltar. Therefore, PoDoLax cannot be a "natural remedy" and to advertise such a preparation as

"Podophyllin with the gripe taken out"

is to offer it under claims that are misleading, false and fraudulent. That the manufacturer knows this is perfectly evident from the fact that these lying claims do not occur on the label of the trade package or in the circulars which accompany it—where they would come within the purview of the law—but are found in advertisements and in circulars which reach the consumer in other ways. Since the Biblical mandrake, *Mandragora autumnalis*,[1] has no botanical or therapeutic relation to the American mandrake, *Podophyllum peltatum*, the attempt to give Biblical sanction to the exploitation of PoDoLax by connecting it with the mandrake of the Bible is to be expected from the usual ignorance, stupidity and dishonesty of the "patent medicine" exploiter.

To sum up:

1. PoDoLax is sold under the claim that it contains podophyllin, whereas it contains none, or at least not more than traces. Its chief medicinal ingredient is phenolphthalein.

2. The false claims concerning the composition of PoDoLax do not occur on the labels of the trade package or in the circulars which go with it, but are made in other ways. This shows the exploiter to be aware of the fraud and deceit practiced in making and selling the nostrum.

Details of Analysis

Phenolphthalein.—This was approximately determined as follows: A measured quantity of the preparation, which was in the form of a syrup, was filtered through a weighed alundum crucible, the insoluble residue washed with water, dried and weighed. The filtrate was slightly acidified, shaken with ether (chloroform was used in one determination), the solvent washed with water, evaporated, the residue dried and weighed. The sum of the water-insoluble and the ether-soluble (or chloroform-soluble) fractions was considered as phenolphthalein. The method is not exact, since ether and chloroform each extract small quantities of material from senna extracts.

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[1] *Mandragora autumnalis* is a poisonous, alkaloid-bearing member of the nightshade family (*Solanaceae*) and is a close relative of belladonna. It was prized by the ancients in the belief that it would cure barrenness, but has never been employed as a cathartic. *Podophyllum peltatum* is a native of America, belongs to the barberry family (*Berberidaceae*) and contains no alkaloids. Although its cathartic properties have been known by the American Indians from prehistoric times the plant was not described by botanists until 1731 (Catesby: Natural History of Carolina, Florida and the Bahama Islands, 1731, i, 24). Since it is not a native of the Old World, it of course could not have been known to the writers of the Bible.

From 50 c.c. of the material 0.7595 gm. of crude phenolpthalein was obtained and the filtration gave 0.0299 gm., making a total of 0.7894 gm. for the sample taken or 1.5788 gm. in each 100 c.c. As a duplicate the contents of an entire bottle were used for a determination. To determine the volume of material to be used for examination, a file-mark was made on the neck of the container at the level of the liquid on an unopened package of PoDoLax. The package was then opened, the contents filtered, the residue washed, dried and weighed as above described. The washed bottle was dried and water was allowed to run into it from a buret until the level coincided with the file-mark. By this method the volume of material was found to be 144.5 c.c., equivalent to about 4.9 fluidounces. The contents of the bottle gave 2.1404 gm. of phenolphthalein. The filtrate was made up to 1,000 c.c. and an aliquot portion of 100 c.c. shaken with chloroform until no more phenolphthalein was extracted. The chloroform fractions were united, the solvent washed with water, evaporated, the residue dried and weighed. From 100 c.c. of the diluted solution 0.020 gm. of crude phenolphthalein was obtained, equivalent to 0.2 gm. for the entire filtrate. The total weight of phenolphthalein obtained from the entire contents of the bottle of PoDoLax examined amounted to 2.3404 gm., equivalent to 1.6196 gm. per 100 c.c. of material. The average for two determinations is 1.5992 gm. of phenolphthalein per 100 c.c. of material. This is equivalent to 7.3 grains per fluidounce, or 1.8 grain of the drug in each directed dose of PoDoLax. As the dose of phenolphthalein usually prescribed is from 1.5 to 3 grains, each dose of PoDoLax contains an average dose of phenolphthalein. By means of the microscope the unpurified phenolphthalein was seen to be composed of small tetrahedral crystals which were for the most part transparent and colorless.

The phenolphthalein was purified by solution in hot alcohol, precipitation in acidulated water, collection of the precipitate by filtration and desiccation. The purified substance melted at 254 C. (uncorr.).

From the color, taste and appearance of various residues obtained in the examination by the extraction of PoDoLax with solvents and subsequent evaporation, it appeared probable that the preparation contained some medicinal substance in addition to phenolphthalein. As confirmatory evidence of this, the phenolphthalein from a portion of the material was removed by filtration as far as possible and a portion of the filtrate equivalent to three directed doses of PoDoLax swallowed by an adult on two occasions. Laxative effects were noted in each. In another test portions of the filtrate equivalent to two doses of PoDoLax were swallowed by each of two individuals. Marked laxative effects were produced in one. In the other the result was doubtful. In these tests the amount of phenolphthalein remaining in solution in the filtrate (because of its scant solubility) was insufficient to produce noticeable laxative effects. From the large doses of the filtered preparation necessary to produce catharsis as compared with the unfiltered material it was concluded that the major proportion of the laxative action of PoDoLax is due to phenolphthalein.

By extracting the acidified, filtered preparation with immiscible solvents and evaporating the solvent, residues were obtained which gave a persistent red color with an excess of sodium hydroxid solution. This pointed to the probable presence of an extract of an emodin-bearing drug.

From the lack of bitterness in the chloroform extracts of the preparation, the extract of aloes and the ordinary extract of cascara were excluded. The taste was also different from that left by rhubarb when similarly treated. It appeared probable that the laxative principle in PoDoLax other than phenolphthalein was either extract of senna or bitterless extract of cascara.

Senna.—The following method was used for the detection of emodin in PoDoLax:

The syrup was diluted with water, faintly acidified with hydrochloric acid and the solution filtered to remove most of the phenolphthalein. The filtrate was neutralized with ammonia water, evaporated to a very thick syrup and the warm syrup extracted with acetone (which had been rendered slightly acid by hydrochloric acid) by stirring with successive small portions of the solvent and decanting from the residue. In this case acetone was found a more suitable solvent than either chloroform or ether, as it formed less troublesome emulsions. The acetone fractions were united, evaporated to dryness on the water-bath, the residue twice moistened with alcohol and evaporated in order to remove the last traces of acetone. The residue was taken up in diluted sodium hydroxid solution, the solution filtered, a slight excess of iodin solution added, followed after a few minutes by a slight excess of hydrochloric acid. The container was cooled for an hour in a water-bath having a temperature below 15 C. and the contents filtered. By this treatment the phenolphthalein was precipitated as tetraiodophenolphthalein, a substance which is very insoluble in water. A precipitate is formed from senna extract but this is sparingly soluble in water. The precipitate on the filter was washed with water several times in order to dissolve a considerable part of the precipitate from senna, a yellow solution being produced. The filtrate and washings were united, the solution treated with a slight excess of sodium sulphite to remove free iodin, and the solution shaken with chloroform. Extractives from senna dissolve with a yellow color. The chloroform was evaporated and the residue treated with a dilute solution of sodium hydroxid. A cherry-red color was produced. By this treatment preparations containing phenolphthalein alone give no red color, or at most a faint purplish-red which soon fades if a considerable excess of the alkali be added. Briefly stated, the method consists in treating an acetone or ether extract of the substance with sodium hydroxid solution, adding iodin solution, followed by hydrochloric acid, removing the tetra-iodophenolphthalein by filtration after standing, shaking out the filtrate with chloroform after adding a sulphite to remove excess of iodin, evaporating the chloroform and treating the residue with sodium hydroxid solution. Partly from the color given by the residue from PoDoLax by this test, and partly from the eliminative tests previously mentioned, it was concluded that PoDoLax contains a preparation of senna.

Alcohol.—This was determined by treating the distillate from 50 c.c. by the Thorpe and Holmes' method for the determination of alcohol in preparations containing volatile oils (*Jour. Chem. Soc.*, 1903, lxxxiii, 313). The final distillate was made up to 50 c.c. and its specific gravity at 15.6 C. found to be 0.9932, equivalent to 4.7 per cent. of absolute alcohol by volume.

Residue on Drying.—A measured portion of the material was dried first on a water-bath with stirring and finally in an air oven at 100 C. until the weight became approximately constant. The residue from 5 c.c. of the material weighed 3.5728 gm., equivalent to about 71.5 gm. per 100 c.c.

Podophyllin (*Resin of Podophyllum*).—Since PoDoLax contains less than 5 per cent. of alcohol it is pharmaceutically impossible for the preparation to contain much resin of podophyllum unless it be in suspension. From the physical appearance of PoDoLax, from the appearance, taste and chemical properties of the insoluble portion and from the taste and chemical properties of the precipitate found by allowing the filtered, acidified preparation to stand for twenty-four hours, it was evident that PoDoLax could not contain any appreciable quantities of resin of podophyllum. A portion of the material (10 c.c.) was diluted with water, filtered and the dilute filtrate shaken with chloroform. The solvent was evaporated and its odor and taste compared with a control to which a few drops of fluidextract of podophyllum U. S. P. had been added. The first residue had none of the odor or taste of podophyllum. In the latter (the control) the odor and taste of podophyllum were readily observable. From these observations it was concluded that "podophyllin" (resin of podophyllum) was absent from PoDoLax or at least not present in more than traces.

THE DETECTION OF EMODIN-BEARING DRUGS IN PRESENCE OF PHENOLPHTHALEIN

L. E. Warren, Ph.C., B.S.

(Reprinted from the American Journal of Pharmacy, October, 1914, p. 444)

Phenolphthalein, either alone or in mixture with other drugs, is a constituent of a number of nostrums which are sold as laxatives. The separation and identification of phenolphathalein in medicines is usually accomplished readily, but its presence may interfere with the identification of other drugs. This is likely to be the case with cascara, senna, and other emodin-bearing drugs. Ordinarily the emodin-bearing drugs as a class would be detected by shaking the faintly acidified extracts with benzene and washing the solvent first with water, which is discarded, and then with very dilute ammonia water.[1] In presence of emodin the ammoniacal layer becomes red, the depth of color and shade depending somewhat upon the amount of emodin present and the source of the drug from which obtained. This test cannot be used in presence of phenolphthalein because this substance behaves like emodin. This holds true in spite of the great insolubility of phenolphthalein in water,[2] for if a solution containing this substance be acidified, diluted with several times its volume of water and filtered, the filtrate will become strongly colored purplish-red on the addition of ammonia water or of potassium hydroxid or sodium hydroxid solution. Or if the acid filtrate be shaken with benzene, the aqueous layer discarded, and the solvent washed with either of these alkaline solutions, the purplish-red color appears at once. Unless the quantity of phenolphthalein be very small the color produced by it with the alkalis will hide or obscure that of any emodin alkali compounds that may be present.

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[1] Bornträger: Ztschr. f. anal. Chem., 1880, xix, 165.

[2] According to McCoy (Am. Chem. Jour., 1904, xxi, 503), the maximum solubility of phenolphthalein in water is approximately a ten thousandth-normal solution. This is equivalent to about 0.0032 gm. of the substance in 100 c.c. This conclusion was reached after approximate determinations had been carried out by two methods. In one 0.0318 gm. of purified phenolphthalein was boiled with 1,200 c.c. of water. On cooling no deposit formed, indicating a solubility greater than twelve-thousandth-normal. In the other, known amounts of tenth normal phenolphthalein (in alcohol) were added to 100 c.c. of five-hundredth-normal ammonia water and the solution neutralized by the addition of 2 c.c. of tenth-normal hydrochloric acid. With 0.5 c.c. of the phenolphthalein solution the resultant solution contained a precipitate of phenolphthalein; with 0.3 c.c. the solution was turbid; with 0.2 c.c. faintly turbid; and with 0.1 c.c. clear, although a slight deposit formed on standing over night. This indicated a solubility of about ten-thousandth-normal, corresponding to 0.00318 gm. per 100 c.c. On the other hand, Zotier (Bull. Soc. chim, 1910 [4], vii, 993), from an average of thirty determinations (method not stated), gives the solubility of phenolphthalein in water as about 0.0092 gm. in 100 c.c.

Under certain conditions, however, the color produced by phenolphthalein and an excess of the fixed alkali hydroxids gradually disappears, owing to the formation of the trimetallic salt of phenolphthalein, leaving the solution colorless. On the other hand, the color of the alkali compounds with emodin is more stable, sometimes lasting for several days.[3] An attempt was made to differentiate by this test between phenolphthalein and emodin when in mixture, but the results were not very satisfactory. If applied to a mixture of phenolphthalein and an extract of an emodin-bearing drug, obtained by extraction with alcohol and evaporation of the solvent, the extracted coloring matter renders the test worthless. If applied to a benzene, chloroform, or ether extract, the confusion of colors renders positive identification doubtful. However, if the red color of the strongly alkaline solution disappears the test is a valuable confirmation of the absence of most of the emodin-bearing drugs. If the color persists after standing for several hours, the presence of an emodin-bearing drug is presumptive. A method seemed desirable by which the phenolphthalein might be removed from such mixtures, thus leaving the emodin free to be tested for in the usual way. Of the several methods used for its quantitative determination, that proposed by Kollo,[4] by which the substance is precipitated as tetra-iodophenolphthalein,[5] seemed the most promising.

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[3] Experiments have shown that if the ether extracts from small amounts of rhubarb be heated on the water-bath for three hours with 50 per cent. sodium hydroxid solution the red color is not destroyed.

[4] Apoth.-Ztg., 1909, xxiv, 283.

Some tests were first made with a preparation known to contain phenolphthalein (most of which was in suspension) and an emodin-bearing drug extract.

The following method was used:

The preparation, which was in the form of a syrup, was diluted with water, faintly acidified and filtered to remove most of the phenolphthalein. The filtrate was neutralized with ammonia water, evaporated to a very thick syrup, and the warm syrup extracted with acetone (which had been rendered slightly acid by hydrochloric acid) by stirring with successive small portions of the solvent and decanting from the residue. In this case acetone was found a more suitable solvent than either chloroform or ether, as it formed less troublesome emulsions. In preparations that do not form emulsions ether extracts are more satisfactory for the subsequent manipulations. The acetone fractions were united, evaporated to dryness on the water-bath, the residue twice moistened with alcohol and evaporated in order to remove the last traces of acetone. The residue was taken up in diluted sodium hydroxid solution, the solution filtered, and a slight excess of iodin test solution added, followed, after a few minutes, by a slight excess of hydrochloric acid. The container was cooled for an hour in a water-bath having a temperature below 15 C. and the contents filtered. By this treatment the phenolphthalein was precipitated as tetra-iodophenolphthalein, a substance which is very insoluble in water. The precipitate on the filter was washed with water several times, a yellow solution being produced. The filtrate and washings were united, the solution treated with a slight excess of sodium sulphite to remove free iodin, and the solution shaken with chloroform. The chloroform was evaporated and the residue treated with dilute solution of sodium hydroxid. By this treatment the anthracene purgatives give red colors which vary in shade, depending somewhat upon the source of the emodin. Preparations containing phenolphthalein alone give no red color, or at most a faint purplish-red, which soon fades if a considerable excess of the alkali be added.

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[5] Tetra iodophenolphthalein was first described by Classen and Loeb (Ber. d. deutsch. Chem. Gesellsch., 1895, xxviii, 1603).

Briefly stated, the method consists in treating an acetone or ether extract of the substance with sodium hydroxid solution, adding iodin solution, followed by hydrochloric acid, removing the tetra-iodophenolphthalein by filtration after standing, shaking out the filtrate with chloroform after adding a sulphite to remove excess of iodin, evaporating the chloroform, and treating the residue with sodium hydroxid solution.

As controls the test was carried out with the fluidextracts of cascara and rhubarb, a mixture of the fluidextracts of senna and licorice, a trade preparation stated to contain senna, a mixture containing aloes and phenolphthalein, and a trade preparation claimed to be a form of bitterless cascara. The residue from the fluidextract of cascara gave a dark-red color with a faint brownish tinge, that from rhubarb a deep red with a suggestion of purplish, that from the senna-licorice mixture a somewhat lighter red with a faint suggestion of yellowish (the licorice did not interfere), that from senna alone a color similar to that from the mixed senna and licorice, that from the aloes and phenolphthalein a faint reddish-yellow, and that from the bitterless cascara preparation a color similar to that given by the fluidextract of cascara. The test with aloes was carried out several times, but with results that were not entirely satisfactory. The colors given for the several drug residues do not differ from each other sufficiently to positively identify the source of the drug, yet they should prove of considerable value as confirmatory evidence. The light red from senna would not ordinarily be mistaken for the deeper red of cascara or of rhubarb, nor the faint reddish-yellow of aloes for any of the others, particularly if controls be carried out. In some instances, on standing, a reddish, flocculent precipitate was formed in the alkaline solutions as finally obtained. On its removal by filtration the filtrate became lighter in color. In the test with the aloes-phenolphthalein mixtures the filtrate became of a reddish-yellow color. On the whole the test is much less satisfactory for aloes than for the other drugs tested.

While these experiments were in progress Bailey[6] published a method of distinguishing chrysophanic acid of rhubarb from phenolphthalein.

By his method the dealcoholized, faintly acidified preparation is shaken with ether, and the solvent layer washed with very dilute ammonia water. The alkaline solution is allowed to stand over night, by which the colored compounds of hæmatoxylon and curcuma, if present, fade. The solution is then acidified and shaken with ether. Only chrysophanic acid and phenolphthalein pass into the solvent. The ether is evaporated and the residue boiled with zinc dust and potassium hydroxid solution until the red color has entirely disappeared. By this treatment chrysophanic acid is reduced, the solution becoming yellowish, and phenolphthalein is reduced to phenolphthalin. The solution is diluted with water, or a drop of hydrogen peroxid solution is added. A cherry-red color appearing at once, indicates chrysophanic acid. Under these conditions phenolphthalin is not oxidized.

Bailey did not apply his method to cascara or to aloes, but implies that it might be used on senna preparations. We have applied the method to the fluidextracts of senna and cascara, to each of which some alcoholic solution of phenolphthalein had been added. In each case the result was satisfactory. It was found necessary to boil the alkaline zinc-dust mixture for some time in order completely to destroy the red color. It was also found that exposure of the boiled solution to the air, as in filtration, was generally sufficient to restore the color to the substance. When the test was applied to Barbadoes aloes the red color given on the addition of hydrogen peroxid solution was slow to appear and was masked considerably by yellow coloring matters. To the limited extent that comparison tests have been carried out it does not appear that either method has any marked advantage over the other. If haematoxylon or curcuma be present, results may be obtained more quickly by the proposed iodin method, since the colors from these substances are destroyed (or removed) by the iodin treatment; hence it is unnecessary to wait over night for the destruction of the coloring-matters by treatment with ammonia.

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[6] Jour. Indust. and Engin. Chem., 1914, vi, 320.

SUMMARY

The presence of phenolphthalein in medicines interferes with the detection of the emodin-bearing drugs.

Phenolphthalein may be removed by treating the ether (or acetone) extract with sodium hydoxid and iodin solutions, adding hydrochloric acid and filtering.

After removal of the phenolphthalein the emodin may be detected in the usual way, using a fixed alkali hydroxid for its solution.

The method was tried on several emodin-bearing drugs and gave satisfaction, except in the case of aloes.

PART II

REPORTS ABSTRACTED AND REPRINTED FROM THE JOURNAL A. M. A. AND FROM THE REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY

ODOR-O-NO

A Dangerous "Perspiration Preventive"

(*Abstracted from The Journal A. M. A., Jan. 3, 1914, p. 54*)

"Odor-o-no" is put on the market by the Odorono Company, Cincinnati, Ohio, and is sold as the "anti dress-shield toilet water."

Some of the claims made for this product are:

> "Keeps the armpits free, dry and natural."
> "Eliminates excessive perspiration. . . ."
> "A perfect antiseptic and a superior deodorant."
> "Guaranteed by the manufacturer to be absolutely harmless."
> "It restores the skin secretions to normal."

Two original, sealed bottles of "Odor-o-no," manufactured by the Odorono Company, Cincinnati, Ohio, were purchased by the laboratory from a local supply house and subjected to a chemical examination. The bottles contained a rose-scented, red liquid, which was acid to litmus paper. The specific gravity of the liquid was 1.16. The following constituents were demonstrated to be present: aluminum, sodium, chlorid (traces of sulphate) and a red dye. Mercury was not found.

The quantitative relations were found to be as follows:

Aluminum (Al)	3.38 per cent.
Chlorid (Cl)	14.12 per cent.
Sodium (Na)	0.17 per cent.
Water, perfume and undetermined matter (by difference)	82.33 per cent.
	100.00 per cent.

Inasmuch as the solution was acid, the difference between the chlorid found and that calculated from the percentage of aluminum and sodium present, is attributed to free hydrochloric acid. Calculation shows 100 c.c. of the solution to be composed essentially as follows:

Aluminum chlorid ($AlCl_3,6H_2O$)	38.8	gm.
Hydrogen chlorid (HCl)	0.86	gm.
Sodium chlorid ($NaCl$)	0.48	gm.
Water and aromatics to make	100	c.c.

Inasmuch as it was rumored that the manufacturers of "Odor-o-no" had made some changes in their formula, a third sealed bottle was purchased Nov. 15, 1913, directly from the manufacturers. Aluminum chlorid was found to be present as the essential constituent in this specimen and a trace of sulphate was found. For practical purposes "Odor-o-no" may be looked on as a 33 per cent. solution of aluminum chlorid (hydrous).

When "Odor-o-no" is placed on the skin, the perspiration decomposes it into aluminum hydroxid and hydrochloric (muriatic) acid. The acid of course will attack the skin, while the aluminum hydroxid (or oxid) is apt to clog the pores. The preparation is both fraudulent and dangerous.

Details of Analysis

After mixing the contents of the two bottles, 25 c.c. of the sample was diluted to 250 c.c. and aliquot parts taken for analysis.

Aluminum.—An aliquot portion was made alkaline with ammonium hydroxid, the precipitate redissolved in hydrochloric acid, and the aluminum hydroxid again precipitated. The aluminum was weighed as Al_2O_3. (The filtrates were combined and used for sodium determinations.) A. Twenty-five c.c. yielded 0.1850 gm. of Al_2O_3, equivalent to 3.38 per cent. Al in original. B. Twenty-five c.c. yielded 0.1858 gm. Al_2O_3, equivalent to 3.39 per cent. Al in original.

Sodium.—Sodium was determined by evaporating the filtrates after the removal of aluminum and igniting, after the addition of a small amount of sulphuric acid. A. Twenty-five c.c. yielded 0.0115 gm. of Na_2SO_4, equivalent to 0.16 per cent. Na.

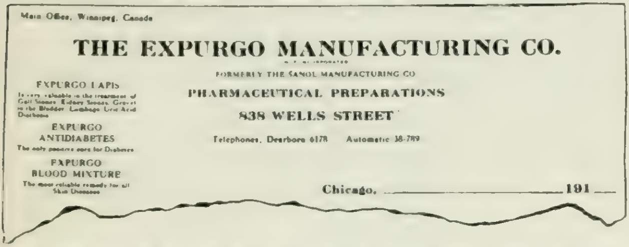
Chlorid.—Chlorid was precipitated in the presence of HNO_3 as AgCl. A. Twenty-five c.c. yielded 1.6513 gm. AgCl, equivalent to 14.07 per cent. Cl. B. Twenty-five c.c. yielded 1.6541 gm. AgCl, equivalent to 14.19 per cent. Cl.

EXPURGO (SANOL) ANTI-DIABETES

One More Fraudulent Nostrum for Diabetes

(*Abstracted from The Journal A. M. A., Jan. 24, 1914, p. 312*)

Expurgo Anti-Diabetes is sold and advertised in the United States by the Expurgo Manufacturing Company, Chicago. The concern is the United States branch of a Canadian company, the Sanol Manufacturing Company, Ltd., Winnipeg, which sells its product in Canada under the name of "Sanol Anti-Diabetes."



Main Office, Winnipeg, Canada

THE EXPURGO MANUFACTURING CO.

FORMERLY THE SANOL MANUFACTURING CO

EXPURGO LAPIS

EXPURGO ANTIDIABETES

The only positive cure for Diabetes

EXPURGO BLOOD MIXTURE

The most reliable remedy for all Skin Diseases

PHARMACEUTICAL PREPARATIONS

838 WELLS STREET

Telephones, Dearborn 6178   Automatic 38-789

Chicago, ______________ 191 __

The letter head of the Expurgo Manufacturing Co. Note the claim that Expurgo Anti-Diabetes is "the only positive cure for diabetes." And this stuff is foisted on the profession through the medical press!

The nostrum is such an evident fraud that one would imagine that even intelligent laymen could not be deceived by it. Nevertheless medical journals both in the United States and Canada have accepted advertisements for this preparation and physicians have been found to give testimonials for it. The medical profession is circularized widely by the concern and "write-ups" have appeared in pseudomedical journals. Some of the claims made for Expurgo Anti-Diabetes are:

"The only positive cure for Diabetes."

"It never fails to effect a Cure in every case of this disease, in whatever form it may present itself provided the patient has not reached the last stages of the malady."

"Expurgo Anti-Diabetes is the New Cure for this deadly affliction."

"Diabetes is certainly curable by our new discovery—Expurgo Anti-Diabetes, provided that the course of the disease has not progressed to the extent that the vital organs are irreparably damaged."

". . . thanks to the discovery of Expurgo Anti-Diabetes, the cure of this dread disease is no longer a matter of doubt."

"With the exception of very advanced cases of Diabetes . . . all diabetes can be cured by Expurgo Anti-Diabetes."

Such claims one would imagine would be more than sufficient to make plain, even to the most uncritical physicians, the evident fraudulence of Expurgo Anti-Diabetes. Nevertheless, the advertisements of this fraud appeared during 1913 in many medical journals.

THE ALLEGED FORMULA

The formula for this nostrum is never published, although in some of the advertising matter it is claimed that it is "at the disposal of physicians." A physician wrote to the Expurgo Manufacturing Company, asking for the formula. He was told that the preparation was "exclusively derived from the vegetable kingdom," from which one may recognize a family likeness to the "dope" put out by the immortal Lydia Pinkham. Further, to copy the letter exactly:

> "The ingredients of which Anti-Diabetes is composed are chiefly:
> "fructus syzigii jambulani
> "cortex syzigii jambulani
> "flores Rosmarini
> "fructus Anisi stellati
> "Extr. fl. Colæ
> "Extr. fl. Condurango
> "Extr. fl. Chinæ spir. spiss.
> "Extr. fl. Calami
> "Extr. fl. Gentianæ."

The recipient of this noncommittal and uninforming "formula" again wrote the Expurgo Manufacturing Company, asking for quantities. Evidently this nostrum concern considered such a request a piece of impertinent inquisitiveness, for it replied to the physician in these terms, given *verbatim et literatim:*

> "*Dear Sir:*—Yours of the 16th duly to hand. We note that you state '. . . I do not like to be working in the dark, and you can readily see that this is the case unless I know how much of each ingredient I am giving. . . .'
>
> "In your letter of the 6th you asked for the composition, which you promptly received. We would like to state that we are dealing with about 600 Doctors. Some of them asked for the formula, which they received. These are all very conscientious gentlemen and none of them ever pretended 'to work in the dark' You know furthermore that none of these ingredients is harmful in any way and yet 'work in the dark.' You know that if there were any harmful ingredients in our preparations, we would expose ourselves to imprisonment. If you are so anxious to know all about it, why do you not analyse our medicine? This would enlighten you in your 'perfect darkness.' If you want to deprive your patients and yourself of the indisputable good of our preparations, simply do not prescribe them. Why finally do you not write to the Doctors whose names we gave, who know enough to be able to enlighten those who need it.
>
> "Truly yours
> "The Expurgo Mfg. Co.,
> "C. M. v. Amerongen, Manager."

More than a year ago, a Wisconsin physician, himself a sufferer from diabetes, wrote The Journal that for three months he had been using Expurgo Anti-Diabetes which the Expurgo people had sent him. He declared that the nostrum had greatly reduced the percentage of sugar in his urine. In its reply, The Journal asked him whether, in testing his urine, he had used portions of twenty-four hour specimens or merely individual specimens. His attention was called to the fact that most of the nostrums for diabetes are diuretics which, by increasing the amount of urine passed, give an apparent decrease in the amount of sugar excreted. A few days later, the physician wrote again, stating that he had committed the very error The Journal had suspected, and reporting that an examination of a twenty-four hour specimen showed that the glucose-excretion, instead of being diminished, actually increased. This matter was referred to editorially in The Journal, Nov. 9, 1912, under the title, "A Possible Fallacy in Testing Diabetic Urine."

Specimens of Expurgo Anti-Diabetes were examined and the following report published in The Journal:

LABORATORY REPORT

"The specimen of Expurgo Anti-Diabetes (Sanol Anti-Diabetes) examined was a light-brown, opaque liquid, having a faintly aromatic odor and bitter taste. The specimen contained considerable amounts of brown, insoluble residue resembling the deposits often found in fluid extracts. The absence of ammonium salts, iodids, glycerin, hexamethylenamin, of antipyrin, pyramidon and similar substances and of such purgatives as aloes, frangula, rhubarb, etc., was indicated. Potent alkaloids such as aconitin, cocain, morphin and strychnin were not found. Qualitative tests indicated the presence of traces of phosphates, sulphates, reducing sugars, caffein and cinchona alkaloids. Alcohol was present only in traces. Small quantities of chlorids, sodium and a salicylate were found. The residue on drying amounted to 2.9 gm. in each 100 c.c. A determination of the salicylic acid indicated approximately 0.17 gm. in each 100 c.c., which is equivalent to less than 0.2 gm., of sodium salicylate per 100 c.c. (about 1 grain to the ounce). Evidently the preparation contains plant extractives in aqueous solution and small amounts of sodium salicylate and sodium chlorid."

Concerning the composition of Expurgo Anti-Diabetes and its exploitation as a diabetes remedy, The Journal commented as follows:

"Summed up, the chemist's report shows that Expurgo Anti-Diabetes is essentially a watery solution of plant extractives with small quantities of sodium salicylate and salt. The exploiters claim their stuff contains the fruit and bark of jambul, rosemary, star anise and fluidextract of calamus, cinchona, cola, condurango and gentian. Since fluidextracts in general are strongly alcoholic and since the laboratory's analysis shows that the preparation contains only traces of alcohol, the fluidextracts of the various drugs, if present at all, must be in an infinitesimal amount.

"Jambul was in vogue as a remedy for diabetes about twenty years ago. It was tried and found wanting, and has long since been relegated to the therapeutic scrap heap. Sanol therefore, is but one more proprietary humbug, foisted on the profession under fraudulent claims, and having for its essential constituent a drug that has long been discarded by scientific men and resurrected for the purposes of quackery. Expurgo will probably be used by uncritical and unthinking physicians and its existence will be artificially prolonged through the venality of pseudo-medical journals. That the medical profession should tolerate such an evident fraud is not to its credit. There is no excuse, either moral or otherwise, for a physician giving patients nostrums of whose composition he is ignorant, and that is what is done whenever Expurgo Anti-Diabetes is prescribed."

CASE'S RHEUMATIC SPECIFIC

Sodium Salicylate as a Wonder Worker

(*Abstracted from The Journal A. M. A., Jan. 31, 1914, p. 394*)

"Case's Rheumatic Specific is not to be compared with any other treatment or medicine for rheumatic diseases." So says Jesse A. Case of Brockton, Mass., "sole proprietor" of this widely heralded "specific." Mr. Case is not a physician but has after his name the letters "F.S.Sc., London." These mystic letters are sold by a fraudulent concern at a guinea apiece.

Jesse A. Case reaches his customers by the usual route—advertisements in the newspapers. In these advertisements he features a free book on "Rheumatism—Its Cause and Cure" and, on these grounds, he maintains that he does not advertise his *product*. Those who write for the book receive a sixteen-page pamphlet telling all about the "rheumatic specific." Mr. Case's claim, therefore, that he does not advertise his preparation is merely an example of beating the devil around a stump. He advertises his booklet and his booklet advertises his nostrum!

The direct claims made in Case's Rheumatic Specific are to the effect that it is "something different;" the inferential claim is that the stuff does not contain salicylates, for instance:

> "Case's Rheumatic Specific is guaranteed not to contain the slightest portion of any opiate of any kind or nature. No Salicylic Acid. . . ."
>
> "I also guarantee it not to contain . . . salicylic acid . . ."
>
> ". . . we have yet to learn of a single case of Rheumatism, Gout or Lumbago, where Case's Pills taken as directed did not work a cure."
>
> ". . . my treatment is not like any other."

Case sells his preparation in packages of two sizes—a "ten days' treatment" at one dollar and a half and a "forty days' treatment" at five dollars. Those purchasing the one dollar and a half treatment receive from Mr. Case the encouraging information—after paying their money: "I do not expect that you will get any results with this small amount of medicine . . ."

Specimens of Case's rheumatic specific were obtained and the preparation was subjected to analysis. The dollar-and-a-half package comes in a small cardboard box bearing these statements:

> "Case's Rheumatic Specific."
>
> "Cures where all else fails rheumatism; muscular, sciatica, lumbago, gout, neuralgia, neuritis."
>
> "The Medicine With 10,000 Cures."

In the box are two circular pill boxes, one of them labeled, "Rheumatic and Gout Pills;" the other, "Bilious and Liver Tablets." The former are large white pills, thirty in the box; the price of these thirty pills is one dollar. The latter are yellow-coated tablets, ten in the box, price fifty cents.

Case's Rheumatic and Gout Pills: The pills had a coating composed of calcium sulphate and sugar. After removal of the coating the pills were dark brown, somewhat soft and of a sweet taste, resembling licorice root. The average weight of the pill, minus the coating, was 0.313 gm. (about 5 grains). The pills, freed from coating, were analyzed with the following result. Qualitatively the presence of the following was demonstrated: sodium, magnesium, calcium (small amount), potassium (small amount), salicylate, sulphate (small amount) and licorice root. The licorice root was identified by aid of the microscope. After ignition the weight of the ash was 31 per cent.—3.5 per cent. being silica and calcium sulphate, the latter probably derived from the coating.

The pills were found to have, essentially, the following composition:

Sodium salicylate	22.4 per cent.
Magnesium oxid	5.3 per cent.
Licorice root to make	100 per cent.

Each pill contains about 0.06 gm. (1 grain) of sodium salicylate.

Case's Bilious and Liver Tablets: These are yellow-coated tablets, the coating being composed essentially of calcium sulphate and sugar. The tablets, freed from their coating, were found to consist essentially of licorice root with aloin or some preparation of aloes, as the purgative agent. Belladonna and strychnin were not found.

Concerning the fraud, THE JOURNAL made the following remarks:

"From the chemist's report we learn that Case's 'treatment' for rheumatism is practically the same treatment that has been used for years—the administering of salicylates. Yet in Case's booklet the inference is given that his 'specific' is an herb that he discovered by chance! That pills of sodium salicylate, whether with or without licorice and magnesia, will have some effect in selected cases of rheumatism, there is no doubt. Sodium salicylate and other salicylates are given daily by physicians for certain forms of rheumatism. There is also no doubt that in exploiting his product as a 'specific,' in implying that it contains no salicylates and that every case of rheumatism will be cured by it, Case is perpetrating a fraud on the public. That there is money in selling pills containing sodium salicylate, licorice root and magnesia at more than three cents apiece, is doubtless true; that the public gets value received is certainly not true."

PYO-ATOXIN

(Abstracted, with additions, from The Journal A. M. A., Feb. 14, 1914, p. 552)

In reply to a considerable number of inquiries, the laboratory took up the examination of Pyo-Atoxin, a gonorrhea remedy, apparently much exploited in the South. A recent correspondent sent with his letter of inquiry several original specimens of the preparation, which were used in this analysis.

The following appeared on the label of the specimens:

"Pyo-Atoxin
Reg. in U. S. Pat. Office
(Capsules)
(Pheno-Methylene-Formate)
'Hurley'
An Antitoxic Agent Indicated in
Gonorrhea, Cystitis, Pyelitis and
Bacteriuric Conditions.
DOSE: One capsule four to six times daily,
Followed by large glass of water.
Guaranteed by
H. O. Hurley,
Manufacturing Pharmacist,
Louisville, Ky.
Under the Food and Drugs Act, June 30, 1906
Serial No. 1710."

The pseudoscientific synonym "pheno-methylene-formate" carries the idea that Pyo-Atoxin is a definite chemical substance. It is unnecessary to say that the term "pheno-methylene-formate" is a meaningless one and its use reminds one of those preparations exploited seven or eight years ago before the Council on Pharmacy and Chemistry began to expose these mixtures masquerading as definite chemical compounds.

The following is a report of the examination:

"The box contained thirty gelatin capsules coated with some black substance giving them the appearance of some of the popular gonorrhea nostrums. When the capsules were opened they were found to contain a powder—about 0.35 gm. or 5 grains per capsule—composed of large white or colorless crystals mixed with a smaller amount of a fine dark powder. The crystals when separated out and dissolved yielded the following characteristic tests for hexamethylenamin: The solution acidified and boiled with sulphuric acid gave off formaldehyd vapors; the remaining acidified solution after boiling when made alkaline with potassium hydroxid and boiled evolved ammonia; bromin water produced an insoluble orange colored precipitate; mercuric chlorid produced an insoluble white precipitate, which became crystalline on standing and which on boiling with sulphuric acid, yielded formaldehyd vapors. The crystals taken from the mixture when ignited burned in the same way that pure hexamethylenamin does. These tests, together with the physical appearance, were taken to identify the substance as hexamethylenamin. A solution of the entire capsule content was deep blue and responded to the U. S. P. tests for methylene blue as follows: The addition of hydrochloric acid changed the color to a lighter blue; the addition of sodium hydroxid solution changed the color to a purplish shade and finally produced a violet-colored precipitate. The blue solution obtained by dissolving the dry powder in sulphuric acid gradually became colorless when metallic zinc was added.

"The name of the preparation suggesting the presence of pyoktanin or methyl violet, tests for this substance were made. On heating Pyo-Atoxin with alcoholic potassium hydroxide, no decolorization took place—a change which would occur were the substance methyl violet. Again, the addition of hydrochloric acid, instead of producing a lighter shade of blue, would have produced a brown color had methyl violet been present. These tests were taken to show the absence of methyl violet (pyoktanin).

"From these tests it was concluded that Pyo-Atoxin consisted essentially of two Pharmacopeial drugs—hexamethylenamin and methylene blue. A quantitative determination of the constituents was considered unnecessary. From its general appearance and properties, however, the hexamethylenamin probably constitutes approximately 60 to 80 per cent. of the preparation."

LOUISENBAD REDUCTION SALT

A Rank Fraud

(Reprinted, with additions, from The Journal A. M. A., Feb. 21, 1914, p. 632)

Louisenbad Reduction Salt is sold by one Karl Landshut, Chicago. It is a white powder and comes in tin boxes containing 14 ounces and costs $1 a box. According to the label, Louisenbad Reduction Salt is:

> "An obesity remedy for the reduction of superfluous fat without the use of drugs, dieting or exercise."

The stuff is supposed to be put in the bathing-water and baths are to be taken "twice a week or oftener." A tablespoonful of the "salt" to a bathtubful of water is the amount prescribed. This artistic touch is added to the label:

> "Should the baths reduce faster than three lbs. per week, they should not be used more than twice a week."

As a supplementary "treatment" it is urged that the unsweetened juice of half a lemon should be taken on the same day that the baths are taken. The prospective purchaser is asked to believe that Louisenbad Reduction Salt has these powers:

> "Removes superfluous fat and gives a slender form and stylish figure."

> "Enters the pores in a natural way, prevents formation of superfluous fat and reduces it where it exists by transforming the fat into strength-giving blood and muscle."

One original sealed package of Louisenbad Reduction Salt was received and subjected to examination.

The contents of the box (weight, 417 gm.) consisted of a dry, white powder. Qualitatively, the following constituents were identified: sodium, potassium, magnesium, chlorid, sulphate and traces of aluminum and iron. Quantitative determinations yielded the following results:

Sodium (Na)	23.8 per cent.
Potassium (K)	14.2 per cent.
Magnesium (Mg)	0.2 per cent.
Sulphate (SO_4)	40.5 per cent.
Chlorid (Cl)	20.0 per cent.
Water (H_2O)	0.37 per cent.
	99.22 per cent.

From the foregoing determinations it was concluded that the specimen examined has essentially the following composition:

Sodium sulphate, anhydrous (dried Glauber salt)	72.4 per cent.
Sodium chlorid (common salt)	11.2 per cent.
Potassium chlorid	16.4 per cent.

The Journal commented as follows on the worthlessness of Louisenbad Reduction Salt:

"It is hardly necessary to say that taking a bath in a tubful of water in which a tablespoonful of a mixture of Glauber salt, table salt and potassium chlorid has been dissolved would have no other effect than that obtained from bathing in the same amount of water without the mixture. Two such baths a week would produce no appreciable effect in the diminution of weight of any individual who was not extremely dirty."

Details of Analysis

Sodium and Potassium.—The weighed sample was treated with $BaCl_2$ and the barium sulphate filtered off and used for the sulphate determination. The filtrate was treated with ammonium carbonate solution and the barium carbonate removed. The filtrate was then made acid with hydrochloric acid and evaporated to dryness. The sodium and potassium were weighed as chlorids and the potassium determined as K_2PtCl_6. 1.1394 gm. of sample yielded 0.9925 gm. of combined chlorids and 0.9990 gm. of potassium chlor-platinate. This is equivalent to 14.24 per cent. of potassium and 23.85 per cent. of sodium.

Magnesium.—The weight of $Mg_2P_2O_7$ from 1.6873 gm. of specimen was 0.0162 gm. This is equivalent to 0.21 per cent. magnesium.

Chlorid.—(*A*) The weight of silver chlorid from 0.7238 gm. of specimen was 0.5947 gm. This is equivalent to 20.2 per cent. (*B*) From 1.0746 gm. of specimen a yield of 0.8616 gm. AgCl was obtained. This is equivalent to 19.9 per cent. chlorid.

Sulphate.—(*A*) From 1.0889 gm. of specimen a yield of 1.0723 gm. of barium sulphate was obtained. This is equivalent to 40.51 per cent. sulphate ($SO_4^{=}$). (*B*) From 1.1394 gm. of specimen a yield of 1.1240 gm. barium sulphate was obtained. This is equivalent to 40.51 per cent. sulphate ($SO_4^{=}$).

GET SLIM

"A Pink Lemonade for Fat People"

(*Abstracted from The Journal A. M. A., Feb. 28, 1914, p. 715*)

Jean Downs of New York City offers to remove "a little lump of fat on the back of the neck" or "knobs on the hips below the corset" and in other ways to reduce the obese to a condition of delightful slimness. It is all done with "Get Slim," which is "not a medicine, but a drink—a purely vegetable, pleasant, healthy drink." "Get Slim" comes in powder form; "it is not laxative" and of course "there is no special dieting." All that is necessary is to dissolve "Get Slim" in water "and drink it, when thirsty, instead of water."

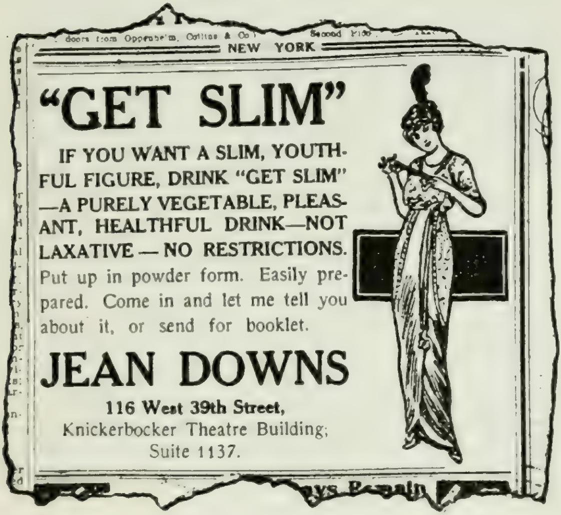
"Get Slim" is sold at $1 a box. A box contains fifteen large envelopes, the same number of smaller envelopes and a package of powder.

An original sealed package of "Get Slim," Jean Downs, New York, was received for examination. The trade package contained three separate smaller packages as follows: (1) The larger package consisted of fifteen envelopes each containing 10 gm. (150 grains) of a pink powder which responded to tests for ordinary sugar (sucrose). No other constituents were found. It is therefore concluded that these powders consist essentially of sugar tinted pink. (2) Package number two was composed of fifteen smaller envelopes each enclosing about 3 gm. (45 grains) of a pink powder. This powder responded to tests for ordinary tartaric acid. With the exception of a trace of red color, no other constituents were found. It is therefore concluded that these powders consist essentially of tartaric acid. (3) The third package contained 115 gm. of a white powder which responded to tests for sodium bicarbonate. No other constituents were found.

Summed up then the report shows that "Get Slim" consists essentially of:

Sugar, colored pink.
Tartaric acid, colored pink.
Sodium bicarbonate.

The directions call for mixing the pink sugar with the pink tartaric acid in a quart of water and adding the juice of one lemon. The sodium bicarbonate is to be dissolved in a quart of hot water and a teaspoonful of the mixture taken three times a day before meals.



NEW YORK

"GET SLIM"

IF YOU WANT A SLIM, YOUTHFUL FIGURE, DRINK "GET SLIM"—A PURELY VEGETABLE, PLEASANT, HEALTHFUL DRINK—NOT LAXATIVE — NO RESTRICTIONS.

Put up in powder form. Easily prepared. Come in and let me tell you about it, or send for booklet.

JEAN DOWNS

116 West 39th Street,
Knickerbocker Theatre Building;
Suite 1137.

The "Get Slim" obesity cure is but a modification of the old-fashioned pink lemonade that used to be sold at the circus before pure food laws interfered with this profitable swindle. It was usual, as will be remembered, to cut up one lemon and float it on top of the barrel. The psychic effect was valuable to the dispensers.

Whatever reduction in weight may be brought about by "Get Slim" is due to the interference with digestion by the use of this synthetic lemonade.

Details of Analysis

Sugar.—Cane-sugar was identified according to "Commercial Organic Analysis" by Allen, Vol. I (third edition), page 290.

Tartaric Acid.—Some of the sample was dissolved in water, and potassium acetate added. A white precipitate was formed. The precipitate was dried and a weighed sample titrated with standard acid. From this determination it was identified as potassium acid tartrate. A rough quantitative estimation, made by weighing the entire dried precipitate, and compared with the weight of the original sample taken, showed at least 90 per cent. tartaric acid. Tests were also made as described in Olson's "Quantative Chemical Analysis," page 251.

Sodium Bicarbonate.—The physical properties of the powder of the "third" package indicated it to be sodium bicarbonate, and a quantitative determination proved this to be its composition; 1.0125 gm. required 12.98 c.c. of normal hydrochloric acid to neutralize.

EVERY WOMAN'S FLESH REDUCER

A Fraudulent Obesity "Cure"

(*From The Journal A. M. A., Feb. 28, 1914, p. 714*)

"Every Woman's Flesh Reducer" is sold by the Every Woman Company, Chicago. It is a white powder, smelling strongly of camphor and comes in a violet-colored tin box. It is an "obesity cure" of the bath-powder type and the directions are to dissolve 5 tablespoonfuls of the powder in an ordinary hot bath.

> "Lie in bath ten minutes each night before retiring. Within one week you will commence to notice the reduction."

Like every other obesity cure, the use of "Every Woman's Flesh Reducer" is said to obviate the necessity of exercising or dieting for reducing weight. For instance:

> "Every Woman's Flesh Reducer will rid both men and women of dangerous, superfluous fat without internal drugs, dieting or exercise."
>
> "Just dissolve Every Woman's Flesh Reducer in your bath and that's all, except that your superfluous fat will fade away . . ."
>
> "No need of starving yourself. . . ."
>
> "Eat what you like. . . ."
>
> "Every Woman's Flesh Reducer will quickly and naturally relieve you of all abnormal fat."

An original package was purchased and submitted to the laboratory for analysis. The box contained 520 gm. (less than 1¼ pounds) of a white, somewhat "cakey" powder, having an odor of camphor. On treating some of the powder with water, an evolution of carbon dioxid took place, leaving, when the reaction had ceased, a flocculent precipitate, soluble only on addition of acids. Qualitative examination indicated the presence of the following constituents: aluminum, magnesium, potassium, sodium, carbonate, citrate, sulphate and camphor.

From a qualitative examination, supplemented by an estimation of the magnesium, aluminum, sulphate and water content, the powder was found to be a mixture of ordinary alum (crystallized potassium aluminum sulphate), about 22 per cent., Epsom salt (crystallized magnesium sulphate) about 34 per cent., with an effervescing base consisting of citric acid and sodium bicarbonate (or possibly sodium carbonate) and small amounts of camphor.

From these findings it is evident that "Every Woman's Flesh Reducer" consists, essentially, of:

Epsom salts
Camphor
Alum
Sodium bicarbonate or carbonate
Citric Acid

The soda and citric acid are apparently put in for the purpose of producing an effervescence when the stuff is dissolved in water. This is probably for psychic effect. That taking a hot bath daily and staying in it for some length of time may reduce weight is doubtless true, though the indiscriminate use of such a method is not to be commended. That putting small quantities of Epsom salt, alum and camphor into a tub would have any effect in the reduction is certainly not true. Like every other bath powder sold as a "cure" for obesity, "Every Woman's Flesh Reducer" is a fraud.

QUESTIONABLE TREATMENT OF MERCURIC CHLORID POISONING

(From The Journal A. M. A., March 7, 1914, p. 796)

The following query was sent to The Journal:

To the Editor:—I note in the Chicago *Tribune* for Feb. 18, 1914, a new method of treating bichlorid of mercury poisoning, attributed to Dr. J. M. Hirsch, which raises several interesting questions. According to Dr. Hirsch, ½ teaspoonful of sodium bicarbonate is to be given every hour for two days, and then every four hours for six days. The following is given as the mode of action:

"Soda converts bichlorid of mercury into calomel and then into insoluble oxids and carbonates of mercury. Calomel acts as a purgative and rids the intestines of mercury. Some of the mercury oxid unites in the intestines with sulphur compounds to make sulphid of mercury, a relatively harmless substance. If the mercury has already been absorbed the soda dissolves the albuminate of mercury and changes it into calomel and oxids, less harmful forms, which the kidneys then excrete.

"If the vomiting prevents the use of soda by the stomach it should be given as follows: One hundred and twenty grams of chemically pure bicarbonate of soda is dissolved in one pint of salt solution (eight parts to every thousand). Inject sixty minims into a vein once every six hours."

The questions that this method suggests are:

1. Will sodium bicarbonate precipitate a solution of corrosive sublimate?

2. Will it produce calomel from corrosive sublimate?

3. How can the kidneys excrete insoluble calomel and oxids more easily than mercury albuminate?

4. Can 120 gm. of sodium bicarbonate be dissolved in 500 c.c. (1 pint) of 0.8 per cent. sodium chlorid solution? A. W.

The laboratory replied to this query as follows:

Answer.—1. No. Sodium bicarbonate will not precipitate mercuric chlorid (corrosive sublimate) quantitatively under conditions similar to those in the stomach. Theoretically this might be interpreted as follows: Mercuric chlorid is one of the salts which are only slightly ionized, and consequently the concentration of the mercuric ion $[Hg^{++}]$ times the square of the concentration of the bicarbonate ion $[\overline{HCO}_3]^2$ is *not* greater than the ion product constant (I. P. C.) for $Hg(HCO_3)_2$.

$$[Hg^{++}] \times [\overline{HCO}_3]^2 < \text{I. P. C.}_{Hg(HCO_3)_2}$$

The mercuric bicarbonate formed in solution, however, is capable of breaking down, but this action will not go to completion unless the carbon dioxid is removed. This would not occur under conditions such as those in the stomach. Experiments conducted in the A. M. A. Laboratory, as well as those reported in standard works, tend to confirm the statement of incomplete precipitation.

2. That sodium bicarbonate will produce mercurous chlorid, $HgCl$ (calomel) from mercuric chlorid, $HgCl_2$ (corrosive sublimate) is contrary to all chemical facts. In order for this to happen the mercuric ion must lose a positive charge, or gain an electron:

$$Hg^{++} - \oplus \rightarrow Hg^{+}$$

In other words, reduction would have to take place, which would be unlikely inasmuch as (*a*) no readily oxidizable substance (that is, no substance capable of taking on an added positive electric charge) would be present; (*b*) mercuric ion [Hg^{++}] is quite stable; therefore, sodium bicarbonate will not reduce mercuric chlorid.

3. We are of the opinion that this is a fallacy. Mercuric albuminate would be more easily excreted by the kidneys than calomel. Probably the oxids and calomel would be entirely eliminated in the feces.

4. Here also Dr. Hirsch has made a mistake. It is impossible to dissolve 120 gm. of sodium bicarbonate in 1 pint (500 c.c.) of water even at 60 C. At body temperature only about 57.5 gm. are soluble in 1 pint of pure water. If sodium chlorid is added (as per directions) this would still further reduce the solubility since a common ion, sodium [Na^+], would be present. This would cause the ionization of sodium bicarbonate to be repressed, and accordingly, in order to establish chemical and physical equilibrium, sodium bicarbonate would necessarily be precipitated from its saturated solution. Hence a still smaller amount of sodium bicarbonate could be dissolved in a salt solution.

THOXOS

(Reprinted, with additions, from The Journal A. M. A., March 21, 1914, p. 949)

Thoxos is a "specialty" of John Wyeth and Brother. From an advertising circular we learn that it "offers to the physician a rational treatment for Rheumatism, both the Subacute and Chronic forms, Lithemia, Rheumatic Arthritis, Gout, Sciatica and the various manifestations of uric diathesis," and that "It is a palatable solution of Strontium and Lithium soluble salts, thirty-two grains, combined with twenty-four minims Wine of Colchicum Seed and a vegetable alterative, in each fluidounce, flavored with aromatics." This "formula" does not indicate the acid with which the metals strontium and lithium are combined, or what the "vegetable alterative" is; it is essentially a secret preparation. To learn what the missing and presumably active ingredients are an analysis was made by our chemists.

LABORATORY REPORT

One original bottle of Thoxos, John Wyeth and Brother, Philadelphia, was purchased and submitted to analysis. The bottle contained a brown liquid having an aromatic odor and a sweet taste. The specific gravity of the liquid was 1.118 at 15 C. (60 F.). The solution was acid to litmus

Qualitatively the following constituents were detected: strontium, potassium, sodium, lithium, ammonium, salicylate, iodid, glycerine, alkaloid, alcohol and water. By the smell and taste, oil of wintergreen, or methyl salicylate, and oil of sassafras were recognized. Positive tests for a saponin-like body indicated the probable presence of sarsaparilla.

Quantitatively the following results were obtained:

Ammonia (NH_3)	0.006	per cent.
Lithium (Li)	0.04	per cent.
Potassium (K)	0.13	per cent.
Sodium (Na)	0.03	per cent.
Strontium (Sr)	1.03	per cent.
Iodid (I)	0.46	per cent.
Salicylate ($C_6H_4.OH.COO$)	4.19	per cent.
Glycerin	19.2	per cent.

From the analytic results it would appear that the preparation contains approximately potassium iodid, 0.67 gm. per hundred c.c., or 3 grains per fluidounce, lithium salicylate $[Li(C_7H_5O_3)]$, 0.9 gm. per hundred c.c., or 4 grains per fluidounce, strontium salicylate $[Sr(C_7H_5O_3)_2.2H_2O]$, 5.75 gm. per hundred c.c., or 26 grains per fluidounce, and some salicylic acid combined with sodium and also in the free state. The total salicylate found is equal to 5.47 gm. of sodium salicylate per hundred c.c., or 25 grains per fluidounce.

As strontium salicylate and lithium salicylate are now generally considered to differ but slightly, if at all, in their action from that of sodium salicylate, each dose of Thoxos, 1 teaspoonful or 4 c.c., may be considered the equivalent of 0.2 gm. or 3 grains of sodium salicylate with a fractional dose of colchicum. Hence this nostrum — for this is the correct definition — is a mixture of no more value than a prescription of sodium salicylate with a fractional dose of potassium iodid and colchicum; one that any doctor could write and any druggist dispense. Yet it is doubtless prescribed by physicians under the belief that it possesses some occult power not to be found in ordinary drugs and their combinations. To prescribe Thoxos is to prescribe a name, and the patient who takes it would be as well off if he went to the nearest drug store and purchased a bottle of any of the thousand and one rheumatism cures with which the country is flooded.

Details of Analysis

Glycerin.—Glycerin was determined by the method described in Leach's Food Analysis, Ed. 7, page 703. Twenty c.c. of the sample yielded 21.5184 gm. glycerin. This is equivalent to 19.2 per cent.

Ammonia.—Twenty-five c.c. of the original was distilled, according to the Kjeldahl method, into 25 c.c. of tenth normal sulphuric acid. The excess acid was titrated with tenth normal sodium hydroxid. The ammonia was found to be equivalent to 1.25 c.c. of tenth normal H_2SO_4 or 0.006 per cent.

Strontium.—Strontium was determined and weighed as strontium sulphate. A. The weight from 20 c.c. of the original was 0.4870 gm. This is equivalent to 1.04 per cent. B. The weight of strontium sulphate from 20 c.c. of the original was 0.4851 gm. This is equivalent to 1.02 per cent.

Lithium.—Lithium was determined by conversion to lithium chlorid, and dissolving out the lithium chlorid with amyl alcohol. The lithium chlorid was then converted to lithium sulphate and weighed as such (see *Am. Chem. Jour.*, xxiv, 392).

Sodium and Potassium.—The strontium was removed and filtrate used for sodium and potassium determinations. A. The weight of the combined sodium, potassium and lithium sulphates from 20 c.c. of the original was 0.1288 gm. The weight of potassium chlorplatinate was 0.8700. This is equivalent to 0.13 per cent potassium and 0.02 per cent. sodium. B. The weight of the combined lithium, sodium and potassium sulphates from 20 c.c. of the sample was 0.1292 gm. The weight of the potassium platinic chlorid was 0.8692 gm. This is equivalent to 0.12 per cent. potassium and 0.03 per cent. sodium.

Iodid.—The iodin, freed from 10 c.c. of the original, was distilled over into potassium iodid, and the iodin titrated with standard sodium thiosulphate. A. Ten c.c. required 4.3 c.c. of tenth normal thiosulphate. This is equivalent to 0.46 per cent. B. Ten c.c. required 4.31 c.c. of tenth normal thiosulphate, or equivalent to 0.46 per cent. iodin.

Salicylate.—The salicylic acid was freed by hydrochloric acid and removed with chloroform. After carefully evaporating the chloroform, and removing the hydrochloric acid by vacuo, the residue was titrated with alkali. A. The residue from 20 c.c. of the original required 6.8 c.c. of normal alkali. This is equivalent to 4.19 per cent. B. The residue from 20 c.c. required 6.81 c.c. of normal alkali. This is equivalent to 4.20 per cent.

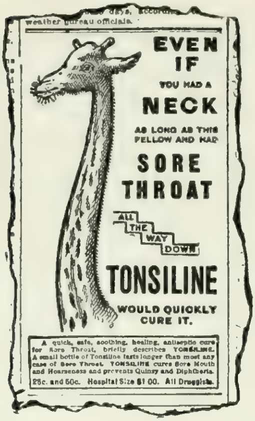
TONSILINE

(Abstracted, with additions, from The Journal A. M. A., April 4, 1914, p. 1109)

Tonsiline is sold by the Tonsiline Company, Canton, Ohio. To determine the nature of this "one and only sore throat cure which is sold over a large part of the United States," it was analyzed in the Association's laboratory.

Three original bottles of Tonsiline were purchased and the contents subjected to examination. The bottles contained a yellow liquid, with an odor resembling that of Tincture of Iron Chlorid, U. S. P., and having an astringent taste. The specific gravity was 1.0418 at 15.6 C. If the solution was cooled below 12 C. crystals of potassium chlorate were formed. Qualitatively the presence of the following was demonstrated: Iron (ferric), potassium, chlorate, chlorid and alcohol. The quantitative determinations gave the following:

Alcohol (by volume)	6.3 per cent.
Iron	0.37 per cent.
Potassium	1.31 per cent.



days, according weather bureau officials.

EVEN IF YOU HAD A NECK AS LONG AS THIS FELLOW AND HAD SORE THROAT ALL THE WAY DOWN TONSILINE WOULD QUICKLY CURE IT.

A quick, safe, soothing, healing, antiseptic cure for Sore Throat, briefly describes TONSILINE. A small bottle of Tonsiline lasts longer than most any case of Sore Throat. TONSILINE cures Sore Mouth and Hoarseness and prevents Quinsy and Diphtheria. 25c. and 50c. Hospital Size $1.00. All Druggists.

From the iron and potassium contents it would be calculated that Tonsiline contains 1.60 per cent. ferric chlorid ($FeCl^3$) and 3.89 per cent. potassium chlorate ($KClO_3$). The amount of ferric chlorid administered in two teaspoonfuls, or 8 c.c., which is the dosage, is essentially the same as that administered in 1-2 c.c. of tincture of ferric chlorid U. S. P., and which is the official dose. In other words Tonsiline is one sixteenth as strong as tincture ferric chlorid.

From the report it is evident that a product having essentially the same composition as Tonsiline would be:

Tincture of chlorid of iron (ferric chlorid), U. S. P.	1 ounce
Alcohol	1 ounce
Potassium chlorate	280 grains
Water, sufficient to make	1 pint

THE JOURNAL made the following comments:

"It is not necessary to tell physicians that Tonsiline never cured sore throat or prevented diphtheria. The stuff contains drugs whose use for these purposes, by the medical profession, is being abandoned. It is the old story of exploiting the public by the use of discarded theories that have been revamped for commercial purposes. The risk of poisoning from the use of potassium chlorate, while well known to the medical profession, is still but little appreciated by the public. The dangers of the indiscriminate use by individuals who may be suffering from kidney disease, of a "patent medicine" containing, as Tonsiline does, a saturated solution of chlorate of potash will be evident to every physician, but not to the layman.

"Summed up: Tonsiline is both inefficient and dangerous."

Details of Analysis

Alcohol.—The specific gravity of the 100 c.c. distillate from 50 c.c. of the original was 0.9953. This is equivalent to 6.30 per cent. by volume.

Iron.—Ten c.c. of the original were taken, diluted, boiled and made ammoniacal. The precipitate was filtered off, washed well, and ignited in a platinum crucible to constant weight. The filtrate was acidified with sulphuric acid, and used for potassium determination. A. Weight of feric oxid was 0.0551 gm. This is equivalent to 0.37 per cent. iron. B. Weight of ferric oxid was 0.0535. This is equivalent to 0.36 per cent. iron.

Potassium.—The filtrate from the iron determination (after acidifying with H_2SO_4) was evaporated on steam bath, and after addition of few drop of sulphuric acid, was heated to ignition. Inasmuch as sodium was absent, the potassium was weighed as potassium sulphate. A. Weight of potassium sulphate was 0.3138 gm. This is equivalent to 1.34 per cent. B. Weight of potassium sulphate was 0.3176. This is equivalent to 1.36 per cent.

CITROLAX

(Reprinted, with additions, from The Journal A. M. A., March 21, 1914, p. 949)

Trade names which give a misleading impression as to the constituents of the substance involved constitute an especially pernicious form of nostrum activity. The extensive newspaper advertisements of a preparation called "Citrolax" have brought it to the attention of the Association laboratory. From the name of the substance and from various statements and implications in the advertising matter, the purchaser is led to believe that it is magnesium citrate in tablet form and superior to the standard solution of citrate of magnesia.

A tablet taken from a trade package, when placed in a glass of water, according to directions on the carton, yielded a milky solution. As citrate of magnesia is completely soluble in water, the presence of insoluble matter in the tablet aroused suspicion. To determine the nature of this insoluble matter, the tablets were examined by our chemists, who report:

Two sets of specimens were therefore purchased for investigation. The first specimens were labeled "Citrolax—The Lemonade Laxative—Made and guaranteed by the Citrolax Company of America—Chicago." The second, purchased three weeks later, were labeled "Citrolax—The Effervescent Laxative—Tastes like Lemonade—Prepared only by Foley and Co., Chicago." The probability is that the party who first put it on the market has sold it to the second, the Foley people. The tablets measure about 1¼ inches in diameter by about ½ inch in thickness; they are sold in 10-cent, 25-cent and 50-cent packages, containing respectively one tablet, three tablets and eight tablets each.

When placed in water Citrolax tablets effervesced with liberation of carbon dioxid and dissolved, with the exception of a small amount of a fine whitish powder, giving the solution a turbid appearance. The solution responded to tests for magnesium, sodium and citrate; the presence of potassium or tartrate could not be demonstrated. The insoluble matter was found to be organic, soluble in alcohol and to dissolve in alkaline solutions with formation of a bright red color, which disappeared on acidification and reappeared on being made alkaline. This substance was further identified as phenolphthalein by its melting-point and the following tests: Zinc dust added to an alkaline aqueous solution and heated caused the color to disappear; lead acetate solution added to an aqueous alkaline solution yielded a violet precipitate which when shaken with ether caused the color to disappear; silver nitrate added to an aqueous alkaline solution yielded a violet precipitate which disappeared on shaking with ether.

Quantitative determinations of the phenolphthalein were made by dissolving a weighed portion of the powdered tablets in water and washing thoroughly with water, then dissolving in alcohol and precipitating from the alcoholic solution by the addition of acid water. The precipitate was washed again and dissolved in hot alcohol and the solution transferred to a weighed dish, evaporated, dried and weighed. To avoid loss the acid water used in precipitating the phenolphthalein was extracted with chloroform and the extracts added to the alcoholic solution. By this method the preparation labeled Foley & Co.' gave the following results: (*a*) 3.1140 gm. material yielded 0.0660 gm. phenolphthalein, or 2.12 per cent.; and (*b*) 1.3156 gm. material yielded 0.0274 gm., or 2.08 per cent., an average of 2.10 per cent. These tablets averaged about 11 gm. in weight. The tablets bearing the label of "The Citrolax Co. of America" gave the following results: (*a*) 1.3404 gm. material yielded 0.0317 gm. phenolphthalein, or 2.37 per cent.; and (*b*) 1.7067 gm. material yielded 0.0416 gm. phenolphthalein, or 2.43 per cent., an average of 2.4 per cent. These tablets averaged about 10 gm. in weight.

The advertisements, as has been mentioned, would lead one to believe that the tablets are a form of magnesium citrate.

The chemical examination shows that each tablet contains 3½ grains of phenolphthalein, or more than an average dose of this drug.

PEARL LA SAGE COMPLEXION TREATMENT

The Beauty-Making Potentialities of Washing Soda and Borax

(Abstracted, with additions, from The Journal A. M. A., April 25, 1914, p. 1345)

Pearl La Sage conducts a fraudulent mail-order business from 2120 Michigan Boulevard, Chicago. She separates the credulous from their cash via the "beauty treatment" route. No matter how atrocious your complexion, send your money to Pearl La Sage, and you will "have a perfect complexion in ten days."

A specimen of the Pearl La Sage complexion treatment was purchased, examined and the following report published in THE JOURNAL:

"The Pearl La Sage Complexion Treatment consists of capsules and tablets of each of which there are about thirty. The contents of the capsules consisted of a coarse, white, odorless powder which had a strongly alkaline taste and which incompletely dissolved in water to form a red, alkaline solution. The contents of 10 capsules weighed 12.7386 gm. or about 20 grains for each capsule. The tablets were a pale pink color and ten of them weighed 7.5160 gm. or nearly 12 grains each. The tablets were partially soluble in water to form a red solution having a strongly alkaline taste. Qualitative tests demonstrated the presence of a borate, a carbonate, sodium and phenolphthalein in the contents of the capsules. A borate, a carbonate, sodium, phenolphthalein and powdered talc were found in the tablets. Other substances were not present in appreciable amounts. Quantitative analysis of the two preparations gave the following results:

	CAPSULES	TABLETS
"Sodium carbonate (Na_2CO_3)	68.10	53.98
Sodium borate ($Na_2B_4O_7$)	10.42	23.60
Phenolphthalein	4.05	5.02
Talcum	...	3.28
Water (loss at 100 C)	17.06	16.19

"From the results of the examination it is concluded that the contents of the capsules are composed essentially as follows:

"Monohydrated sodium carbonate (Na_2CO_3,H_2O)	80 parts
Dried sodium borate (dried borax)	16 parts
Phenolphthalein	4 parts

"The results of the examination indicate that the composition of the tablets is about as follows:

"Monohydrated sodium carbonate (Na_2CO_3,H_2O)	63 parts
Dried sodium borate (dried borax)	29 parts
Phenolphthalein	5 parts
Talcum (talc)	3 parts

"In addition to the 'complexion treatment,' Pearl La Sage sends with it some of what she calls laxative 'pills.' These were small, brown tablets. Preliminary tests indicated that they contained some anthraquinone-bearing drug, probably extract of cascara, and a trace of an alkaloid, probably strychnin."

THE JOURNAL summarized the analysis of the "treatment" and, concerning the methods by which the preparations are distributed, commented as follows:

SUMMARY

"Evidently, therefore, the Pearl La Sage treatment consists essentially of a weak solution of ordinary soda and borax, with a little phenolphthalein as a coloring agent. And this is the mixture which is sold at an exorbitant price, under the claim that, 'It heals, soothes, cleanses, softens and beautifies the skin, removing all impurities, pimples, blotches, blackheads, eruptions, sallowness or lack of color, muddy complexion, liver spots and other skin imperfections.'

"When the public can be defrauded as easily as this, is it any wonder that actresses and others forsake the ill-paid drudgery of hard work for the 'easy money' in fraudulent mail-order schemes?"

Details of Analysis

Qualitative tests demonstrated the presence of sodium, a carbonate, a borate and phenolphthalein in each of the preparations; in addition, talcum was found in the tablets. The material was in the form of a coarse powder. Examination with a small lens revealed that particles were present, of at least two kinds, some of which were as large as 3 mm. in diameter. By means of the lens and a small spatula some particles of each kind observed were obtained. One kind was in the form of colorless crystals which responded to tests for a carbonate and sodium. It was concluded that this material was monohydrated sodium carbonate, $Na_2CO_3.H_2O$. The other kind was in the form of opaque, white, amorphous masses which responded to tests for a borate and sodium. It was concluded that this material was dried borax.

Because of the presence of phenolphthalein and sodium borate, the sodium carbonate could not be titrated directly with normal acid and methyl orange. Attempts to remove the phenolphthalein by washing the material with alcohol and filtering were not successful, as traces of the indicator sufficient to act remained behind. Gentle ignition of the material, in order to destroy the indicator, and subsequent titration of the residue with normal acid and methyl orange did not give satisfactory results. Because of the presence of sodium carbonate and phenolphthalein, the sodium borate could not be titrated by Thompson's glycerol method.

Sodium Carbonate.—This was determined in the Knorr apparatus as described in the provisional method of the A. O. A. C. (*Bur. Chem. Bull.*, 107, p. 169).

Contents of Capsules: From 0.7433 gm. of the material, 0.2152 gm. of carbon dioxid was obtained, equivalent to 0.5077 gm. of anhydrous sodium carbonate, or 68.30 per cent. From 0.7382 gm. of material 0.2065 gm. of carbon dioxid was obtained, equivalent to 0.4980 gm. of anhydrous sodium carbonate, or 67.91 per cent. Average, 68.10 per cent. of anhydrous sodium carbonate, equivalent to 79.67 per cent. of monohydrated sodium carbonate ($Na_2CO_3.H_2O$).

Tablets: A quantity of the tablets was powdered in a mortar and the material thoroughly mixed. From 0.6226 gm. of the material 0.1398 gm. of carbon dioxid was obtained, equivalent to 0.3371 gm. of anhydrous sodium carbonate, or 54.15 per cent. From 0.6172 gm. of the material 0.1377 gm. of carbon dioxid was obtained, equivalent to 0.3321 gm. of anhydrous sodium carbonate, or 53.80 per cent. Average, 53.98 per cent. of anhydrous sodium carbonate, equivalent to 63.15 per cent. of monohydrated sodium carbonate.

Sodium Borate.—This was determined by a combination of the Gooch (*Chem. News*, 1887, lv, 7) and the Thompson (*Jour. Soc. Chem. Ind.*, 1883, xii, 432) methods (Reports Chem. Lab., A. M. A., 1912, v, 69). Sulphuric acid was used in the distillation in place of nitric acid.

Contents of Capsules: The distillate from 1.2953 gm. of the material consumed 2.7 c.c. of normal potassium hydroxid, equivalent to 0.1354 gm. of anhydrous sodium borate, or 10.45 per cent. The distillate from 2.2674 gm. of material required 4.7 c.c. of normal potassium hydroxid, equivalent to 0.2356 gm. of anhydrous sodium borate, or 10.39 per cent. Average, 10.42 per cent. of anhydrous sodium borate.

Tablets: The distillate from 0.9582 gm. of the material consumed 4.52 c.c. of normal potassium hydroxid, equivalent to 0.2266 gm. of anhydrous sodium borate, or 23.64 per cent. The distillate from 0.6276 gm. of the material required 2.95 c.c. of tenth-normal potassium hydroxid, equivalent to 0.1479 gm. of anhydrous sodium borate, or 23.56 per cent. Average, 23.60 per cent. of anhydrous sodium borate.

Phenolphthalein.—This was determined by washing some of the material with successive small portions of alcohol until all of the phenolphthalein had been removed, filtering, evaporating the filtrate and drying the residue at 100 C.

Contents of Capsules: The phenolphthalein from 1.1213 gm. of the material weighed 0.0452 gm., equivalent to 4.3 per cent. The residue from 1.0452 gm. of the material weighed 0.0397 gm., equivalent to 3.80 per cent. Average, 4.05 per cent. phenolphthalein.

Tablets: The phenolphthalein from 1.1498 gm. of material weighed 0.0558 gm., equivalent to 4.86 per cent. The residue from 1.1994 gm. of the material weighed 0.0623 gm., equivalent to 5.19 per cent. Average, 5.02 per cent. of phenolphthalein.

Talcum.—A weighed portion of the material was dissolved in very dilute hydrochloric acid so far as possible, the mixture filtered, the residue washed with alcohol, dried, ignited and the residue weighed as talc. From 1.1994 gm. of the powdered tablet material 0.0409 gm. of talc was obtained, equivalent to 3.41 per cent. From 2.9310 gm. of the material 0.0927 gm. of talc was obtained, equivalent to 3.16 per cent. Average, 3.28 per cent. talc.

Loss on Drying.—This was determined by drying in an air bath at 100 C.

Contents of Capsules: The loss from 1.1213 gm. of the material amounted to 0.1903 gm., equivalent to 16.97 per cent. The loss from 1.0452 gm. of the material was 0.1793 gm., equivalent to 17.15 per cent. Average, 17.06 per cent.

Tablets: The loss from 1.1498 gm. of the material was 0.1893 gm., equivalent to 16.46 per cent. The loss from 1.1994 gm. of the material was 0.1910 gm., equivalent to 15.92 per cent. Average, 16.19 per cent. loss on drying.

LOWER'S GERMEN PRESCRIPTION

(*Abstracted, with additions, from The Journal A. M. A., May 2, 1914, p. 1418*)

Lower's Germen Prescription is sold as a cure for tuberculosis by Lower's Pharmacy of Marion, Ohio. This nostrum is said to be the "discovery" of one C. A. Lower, one of the proprietors of the Lower Pharmacy. The following are among the many claims made for the preparation:

"The most Deadly Foe to the Great White Plague—TUBERCULOSIS—Science Has Yet Produced."

"Its record is perfect."

"Germen Prescription is a Permanent Cure."

"A Genuine Cure for Tuberculosis."

"Its Record of Cures of Tuberculosis is Higher Than Any Other Known Remedy."

According to Lower "it takes from 15 to 30 large bottles of Germen Prescription to remove the tuberculosis poison." The "large" bottles cost the unfortunate victim $2 each.

A sealed original package of Lower's Germen Prescription was obtained for analytical purposes and subjected to examination. The label on the bottle, in addition to declaring the presence of 5 per cent. of alcohol, gives what purports to be the composition of this nostrum in bastard Latin, thus:

"Herb Menthae peperitae.
"Herb Marrubium Vulgarae
"Ex Balsanum Tolutonum
"Herb Hydrastis Canadensis
"Scillae Maratinia, Mentholis
"Ex Virginianna Prunus
"Ex Capsici Fastiagatum"

This formula reduced to English would read:

Peppermint
Horehound
Extract of Balsam of Tolu
Golden Seal
Squills.
Menthol
Extract of wild cherry
Cayenne pepper.

The quantities of the various constituents are not given, of course, except in the case of alcohol, which the Food and Drugs Act requires.

The following analytical report was published in THE JOURNAL:

> "Qualitative tests of Lower's Germen Prescription indicated the presence of sugar, menthol, capsicum and traces of alkaloids, probably hydrastin and berberin. Quantitative determinations indicated the presence of 2.93 per cent. of alcohol by volume, 1.83 gm. of menthol and about 0.01 gm. of alkaloidal substance in each 100 c.c. Since the alcoholic content is but 2.93 per cent. appreciable quantities of the balsam of tolu can not be present. Since the recognition of small amounts of horehound, squills and wild cherry in complex mixtures is very difficult no attempt was made to determine the presence of these substances other than by odor and taste. According to Herder (*Arch. Pharm.*, 1906, ccxliv, 120) and to Astolfoni (*Bull. Chim. Farm.*, 1904, xliii, 117) the alkaloids of hydrastis are found only in the rhizome and roots of the plant. According to this the preparation should not contain any alkaloids from hydrastis since the herb of this plant only is claimed to be present. The traces of alkaloid found appear to be a mixture of hydrastin and berberin, thus indicating that the rhizome and roots of hydrastin, rather than the herb, had probably been employed. Whether or not such drugs as horehound, balsam of tolu and wild cherry are present matters little since they are of so little therapeutic value. It is evident that whatever therapeutic value the preparation may possess is due largely to the menthol."

Concerning the preparation and the methods used in its exploitation, THE JOURNAL commented as follows:

"Evidently, therefore, this peppermint-horehound-cayenne pepper-menthol mixture has but one drug present in sufficient quantities to have any therapeutic effect—menthol. It hardly requires medical knowledge to recognize the absolute fraudulence of claiming that this mixture will "cure" consumption. About the only effect that the continued use of Germen Prescription will have, is that of deranging the digestion of the person taking it. This in itself shows the viciousness of the preparation, for it has been well said that the consumptive gets well on his stomach. The ability of the tuberculous sufferer to digest food is a necessity if he would successfully combat the inroads of the bacilli.

Summed up then, it may be said that Lower's Germen Prescription will shorten the life of every consumptive who depends on it for his recovery. The only beneficiaries of the sale of this worthless and harmful mixture are the Lower Pharmacy and those newspapers that are willing to share the blood money thus obtained. Of all tainted dollars few are quite so dirty as those wrung by deceit and fraud from the unfortunate but ever-hopeful consumptive."

Details of Analysis

Menthol.—This was determined by an adaptation of the method described in the Annual Reports of the Chemical Laboratory, A. M. A., 1913, vi, 42. As carried out on Lower's Germen Prescription, the method is as follows:

> Fifty c.c. of the material were distilled with steam until the distillate no longer gave the odor and taste of menthol. About 200 c.c. of distillate were collected. The distillate was chilled and allowed to stand for some hours. Most of the menthol separated in colorless crystals. The mixture was filtered and the crystals on the filter dissolved by washing with a few cubic centimeters of absolute alcohol, the solution being collected in a 25 c.c. volumetric flask. The aqueous filtrate was saturated with sodium chlorid and distilled until 25 c.c. of distillate were obtained. This distillate was chilled, filtered and the solid menthol dissolved in absolute alcohol as above, the solution being added to the volumetric flask. The filtrate was diluted to about 50 c.c. with water, the solution saturated with sodium chlorid and distilled until about 100 c.c. of distillate were obtained. This was saturated with sodium chlorid, shaken with ether, the solvent removed, and allowed to evaporate spontaneously. The residue was taken up in absolute alcohol, the solution added to the united alcoholic solutions above obtained, the solution made up to 25 c.c. with absolute

alcohol, the solution filtered and its optical value determined in a 200 mm. tube. The rotation found was —0.905°, equivalent to 1.83 gm. of menthol in 100 c.c. of the material. This value is based on the observations of Arth (*Ann. de chim. et de phys.*, 1886 [6], vii, 438) who reports that in a 5 per cent. alcoholic solution, menthol has a specific rotatory value of —49.4°.

Alcohol.—This was determined by the Thorpe and Holmes' method for the determination of alcohol in preparations containing volatile oils (*Jour. Chem. Soc.*, 1903, lxxxiii, 313). The final distillate from 47.4 c.c. of the material was made up to 50 c.c. and the specific gravity of the solution found to be 0.9959, equivalent to 2.93 per cent. of alcohol.

DR. JIROCH "PROOF TREATMENT"

A Fraudulent Mail-Order Medical Concern

(Abstracted from The Journal A. M. A., July 11, 1914, p. 179)

The Dr. Jiroch Company, 533 South Wabash Avenue, Chicago, which on June 24, 1914, was declared fraudulent and denied the use of the mails by the federal authorities, made a practice of offering, through advertisements and circular letters, to send "free proof treatments" and diagnosis of conditions, the applicant being asked to check a list of symptoms.

Those who applied for the "free proof treatment" received two small boxes of tablets, one kind pink, sugar coated and ovoid in shape varying in number from four to six; the other white or very faintly pinkish, sugar coated and cylinder shaped varying in number from seven to fourteen. By the same mail, a circular letter came giving directions as to the use of the "free treatment." This "letter" also was prepared in imitation of typewriting and the name of the individual to whom it was sent was filled in by means of a typewriter. All of the "proof treatments" seem to have been identical irrespective of the age or sex of the persons to whom they were sent or whether the recipients were suffering from consumption, rheumatism or malaria.

Within twenty-four hours of receiving the "free treatment" the patient had inflicted on him, unasked, a "full size treatment." This came in a cardboard box holding four small boxes numbered respectively, "1," "2," "3" and "4." The boxes were labeled as follows:

Box 1.: "Prescription No. 16759. Directions: Take one tablet before or after the morning meal. Swallow with a little water."

Box 2.: "Prescription No. 29408. Directions: Take one tablet before or after the noon meal. Swallow with a little water."

Box 3: "Prescription No. 30651. Directions: Take one tablet before or after the evening meal. Swallow with a little water."

Box 4: "No. 4039. Directions: Take one tablet at bedtime, or as often as necessary to insure about two movements of your bowels each day."

The tablets labeled Prescription No. "16759" that came in Box 1 are white or faintly pinkish, sugar-coated, cylindrical-shaped tablets, apparently identical with part of the "free proof treatment."

The tablets in the box labeled Prescription No. "29408" were large, bright yellow, sugar-coated tablets.

The tablets in Box 3—Prescription No. "30651" were brown, uncoated tablets oval in shape.

The tablets in Box 4, labeled "No. 4039," were apparently identical with the pink tablets that came with the "free proof treatment."

ANALYSIS OF THE "TREATMENT"

A complete set of the "Dr. Jiroch Treatment" was subjected to examination in the Association's laboratory, and the chemists' findings may be briefly summarized as follows:

Box 1. (℞ 16759): These pinkish pills were found to contain licorice root, starch, some vegetable extractive and a trace of alkaloid, apparently strychnin.

Box 2. (℞ 29408): These yellow pills were found to have for their chief constituents powdered licorice root and corn-starch with small quantities of vegetable extractive.

Box 3. (℞ 30651): These tablets, according to the chemists, were found to consist essentially of corn-starch and extract of nux vomica. Quantitative analysis indicated that the total alkaloidal content was equivalent to about ⅓ grain of nux vomica in each tablet.

Box 4. (℞ 4039): These pink pills were found to consist essentially of starch and aloes, with a trace of strychnin. No other medicinal ingredient was found.

ANGIER'S EMULSION

(Abstracted from The Journal A. M. A., Sept. 12, 1914, p. 962)

Angier's Emulsion is essentially a petroleum product. When it was first put on the market commercial interests had been fostering the idea that petroleum products had food-value, and the manufacturers of Angier's Emulsion, making use of the idea, advertised it as a "food-medicine" and an "ideal substitute for cod-liver oil." The impression thus created has been kept alive through persistent advertising in spite of scientific proof to the contrary. To-day many who know that petroleum products have no food-value are still likely unconsciously to class Angier's Emulsion among nutrients. Although the manufacturers now advertise this product as "purely mechanical in its action," they yet show a disposition to profit by the old misapprehension, since, so far from expressly disavowing the old claims as erroneous, they mingle with the new ones vague claims of "tonic and reconstructive merits" apparently designed to sustain, in those who do not take time to consider the evidence carefully, the old faith in the claimed nutritive qualities of the preparation.

According to a circular which was contained in a trade package recently purchased

> "Each fluidounce of Angier's Petroleum Emulsion with hypophosphites contains: 33⅓ per cent. of our specially purified Petroleum; 9 grains of the combined hypophosphites of lime and soda, chemically pure glycerin and the necessary emulsifying agents."

As regards the nature of the product referred to under the indefinite term "petroleum" the circular states that Angier's Emulsion is:

> ". . . prepared with refined petroleum specially purified for the purpose. By a process peculiarly our own the crude petroleum, obtained from special wells is so purified that all taste and odor and all objectionable and irritating properties are removed, while the full medicinal value of the oil is retained. . . ."

The composition assigned to Angier's Emulsion in an advertising pamphlet "The Petroleum Idea," issued in 1907 differs in that it is said to contain "specially purified crude petroleum" and that each fluidounce is said to contain 2.84 grains of benzoate of sodium. While these quotations convey the impression that certain medicinal constituents of the "specially purified" product obtained from "special wells" are "retained," a pamphlet recommending the use of Angier's

Emulsion for the treatment of constipation assures us that it produces the "mechanical effects of the purest petroleum" and that it is "purely mechanical in its action."[1]

The statements regarding the identity of the "petroleum" were so unsatisfactory and contradictory (in one place "refined petroleum specially purified for the purpose," in another "specially purified crude petroleum"—in one place "medicinal" and in another "purely mechanical in its action") that the laboratory was requested by the Council to establish the character of the petroleum product and to determine the presence or absence of sodium benzoate, at one time declared by the manufacturers to be present but later omitted from the formula. The laboratory reported as follows:

Angier's Petroleum Emulsion as purchased on the open market is a white, rather cream-colored emulsion, practically tasteless and almost odorless. It mixes well with water, acids and alkalies without disturbing the emulsion. Mixed with alcohol the emulsion is broken up and a conglomerate mass is formed at the bottom of the liquid. This precipitate when washed with alcohol leaves a mixture from which ether extracts an oil having all the properties of petrolatum. The oil was light brown in color with a slight bluish fluorescence and possessing a slight taste and odor of petroleum. The oil was more limpid than the U. S. P. Petrolatum and more viscous than the Petrolatum Liquidum. It had all the appearance of a heavy lubricating oil. Saponification of the oil indicated the absence of any saponifiable vegetable or animal oils. The specific gravity of the oil at 60 degrees was found to be 0.872.

Attempts to determine the oil quantitatively were made by following the method of Eldred and Bartholomew (*Proc. Am. Pharm. Assn.,* 1908, p. 838), which consisted in weighing the emulsion to a beaker, adding five volumes of alcohol (95 per cent.) and thoroughly breaking up the precipitate with a rod and filtering through a weighed Gooch crucible and washing with alcohol. The Gooch and contents were extracted with ether in a Soxhlet extractor and then extracted with alcohol in the same apparatus. The residue when dried represents the gum and all matter insoluble in ether or in alcohol. The ether extract contains the oil, and the alcoholic washings and extracts contain any glycerin that might be present and such salts as hypophosphites which are claimed to be present.

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[1] As is the custom in the exploitation of proprietary medicines, the preparation which is the firm's main output—the leader—is made to do duty as an advertising medium for auxillary preparations. Thus the Angier Emulsion booklet advises the use of Angier's Throat Tablets. These tablets are alleged to be composed essentially of elm bark and petroleum, are claimed to "promote appetite and aid digestion," and it is stated that "their healing action on all mucous surfaces makes them decidedly beneficial, not only to the pulmonary tract, but on the digestive areas as well." Angier's Throat Tablets were examined in the Association's Laboratory to determine the amount and kind of petroleum present in the tablets, and the results of that examination are given following the results of the examination of Angier's Emulsion.

To determine more closely the oil extracted, the ether extracts were evaporated in a tared dish and the residue dried and weighed. This method, however, was not accurate, as the oil gradually lost weight even when dried in a desiccator. It was found, however, that the first weight after evaporating the ether off was about 33 per cent., so that, roughly speaking, the emulsion consisted of about one-third oil.

The residue left by the ether extraction was found to be white in color and soluble in water, from which solution alcohol precipitated it. With water it forms a mucilage and when boiled for some time with dilute acids reducing sugars are formed. These tests, together with its general appearance and properties, were taken to show that the substance was gum acacia or tragacanth.

Ignition of a sample yielded a residue which when taken up in hydrochloric acid responded to tests for calcium, sodium and phosphate, indicating the probable presence of sodium and calcium glycerophosphate.

The alcoholic solution and washings on evaporation leave a residue which has the general properties of glycerin and responds to the ordinary tests for that substance. The glycerin when heated yields a crystalline sublimate, responding to tests for benzoic acid.

The foregoing tests show that Angier's Petroleum Emulsion is essentially an oil emulsion of a heavy petroleum oil, containing some glycerin, a small amount of benzoic acid and probably hypophosphites of sodium and calcium emulsified with a gum.

ANGIER'S THROAT TABLETS

Angier's Throat Tablets are round brown tablets weighing on the average 1.18 gm. (16⅔ grains). When placed in the mouth they partially soften, yielding a rather mucilaginous substance. As the tablets were claimed to contain the same oil that was found in the emulsion, they were powdered and extracted with ether. When ether was evaporated and the residue weighed without drying to constant weight, it was found that the oil constituted about 11.7 per cent. of the tablet. The matter insoluble in ether was found to contain sugar and some substance which appeared to be elm bark and gum.

IODIA

(Abstracted, with additions, from The Journal A. M. A., Nov. 21, 1914, p. 1871)

Iodia was refused recognition by the Council on Pharmacy and Chemistry and the Council's report, of which the following is a part, was published in THE JOURNAL:

The composition of Iodia is given thus:

> "Formula.—Iodia is a combination of active principles obtained from the green roots of Stillingia, Helonias, Saxifraga, Menispermum and aromatics. Each fluid drachm also contains two and one-half grains Iod.-Potas. and one and one-half grains Phos.-Iron."

We are told that:

> "Its several ingredients are selected with scrupulous care, and the most exacting methods are constantly employed to insure absolute uniformity and maximum therapeutic potency."

This "formula" is an absurdity: First, the amounts of the "active principles" of the plants named are not given; second, these "principles," with the possible exception of menispermum alkaloids, have not been isolated; and, third, ferric phosphate and potassium iodid are incompatible! Incidentally, there are no methods whereby it is possible to secure "absolute uniformity" of a mixture such as Iodia is claimed to be.

Qualitative tests demonstrated the absence of iron and the absence of all but traces of phosphorus compounds (0.015 gm. phosphorus per 100 c.c.). Minute traces of alkaloids, possibly from menispermum, were found (that amount being about 0.004 gm. per hundred c.c. of the preparation). Therapeutically this quantity is entirely negligible. Determinations of iodid demonstrated the presence of only about 60 per cent. of the amount of potassium iodid claimed. The "formula" for Iodia is false and misleading.

It should be noted that the discrepancies here reported between the actual and the claimed composition of Iodia were pointed out more than thirty years ago by A. B. Lyons (Detroit *Lancet*, October, 1882, vi, 157-8), who found that Iodia was deficient in iodid content and practically free from iron.

Details of Analysis

Alcohol.—A specimen of Iodia (a product sold by Battle & Co. of St. Louis) which had been distributed as a physician's sample was first examined. Although there was no declaration of the presence of alcohol on the label the odor of the preparation was suggestive of that constituent. Accordingly quantitative tests for alcohol were carried out according to the provisional method of the Association of Official

Agricultural Chemists (*Bur. Chem. Bull.*, 107, p. 83). The specific gravity of the distillate was 0.9653 at $\frac{15.6\text{C.}}{15.6\text{C.}}$ corresponding to 30.07 per cent. of absolute alcohol by volume. Later a market specimen was purchased and on the label of this the presence of 30 per cent. of alcohol was declared.

Qualitative tests indicated the presence of traces of ammonia, phosphorus and alkaloids, as well as considerable amounts of an iodid and of potassium ions. Iron was absent.

Phosphorus.—The organic matter in 25 c.c. of material was destroyed by heating with a mixture of concentrated sulphuric acid and nitric acid (Neumann method), the phosphorus was precipitated with ammonium molybdate solution, the precipitate dissolved in ammonia water, the phosphate precipitated by magnesia mixture solution, the precipitate collected and heated with the usual precautions and the residue of magnesium pyrophosphate weighed.

$$Mg_2P_2O_7 \times 0.27838 = P$$

The magnesium pyrophosphate from 25 c.c. of the material weighed 0.0134 gm., equivalent to 0.0037 gm. of phosphorus, or about 0.015 gm. per hundred c.c.

Alkaloids.—To 10 c.c. of the material a slight excess of ammonia water was added and the mixture shaken repeatedly with small portions of chloroform. The chloroform extracts were united and the mixture shaken repeatedly with small portions of very dilute hydrochloric acid. The acid fractions were united, the mixture made alkaline with ammonia water, and shaken with several portions of chloroform. The solvent was evaporated, the residue dried and weighed. The alkaloidal residue from 10 c.c. weighed 0.0004 gm., equivalent to about 0.004 gm. per hundred c.c. of material.

Iodin.—Iodin was first determined by distilling with ferric ammonium sulphate and sulphuric acid, collecting the liberated iodin in potassium iodid solution and titrating with tenth-normal sodium thiosulphate, using starch solution as indicator.

$$1 \text{ c.c. of } N/10\ Na_2S_2O_3 = 0.01259 \text{ gm. of I}$$

The iodin distilled from 10 c.c. of the material required 14.45 c.c. of tenth-normal sodium thiosulphate, equivalent to 0.1819 gm. of iodin or about 2.38 gm. of potassium iodid per hundred c.c. This is equivalent to 10.86 grains per fluidounce, or about 55 per cent. of the amount claimed. A duplicate determination gave the same results.

Iodin was also determined by precipitation with silver nitrate in acid solution and weighing as silver iodid. No correction was made for chlorid that may have been present.

The silver haloid from 10 c.c. of the material weighed 0.3930 gm., equivalent to 0.2123 gm. of iodin or 2.7787 gm. of potassium iodid in each one hundred c.c. This is equivalent to about 12.6 grains per fluid ounce, or about 63 per cent. of the amount claimed.

WARNER'S SAFE REMEDY

An Unsafe and Fraudulent Nostrum

(Abstracted, with additions, from The Journal A. M. A., Dec. 19, 1914, p. 2246)

"Warner's Safe Remedy for the Kidneys and Liver and Bright's Disease" was sold, not long ago, as "Warner's Safe Cure for Kidney and Liver, Bright's Disease, Urinary Disorders, Female Complaints, General Debility, Malaria and all Diseases caused by Disordered Kidneys and Liver." The company that puts the product on the market was known, until recently, as Warner's Safe Cure Company, Rochester, N. Y. It is now "Warner's Safe Remedies Company." The Warner concern is said to be leased by, and practically a subsidiary company of the New York and Kentucky Company, distillers and wholesale liquor dealers of Rochester, whose business is frankly and openly the manufacture of whiskies. Another subsidiary concern of the New York and Kentucky Company is the Duffy Malt Whiskey Company.

The advertisements of this nostrum contained what purported to be a sure and simple test for kidney disease. The "test" by which the susceptible were to be frightened into a belief that they were seriously ill was described thus:

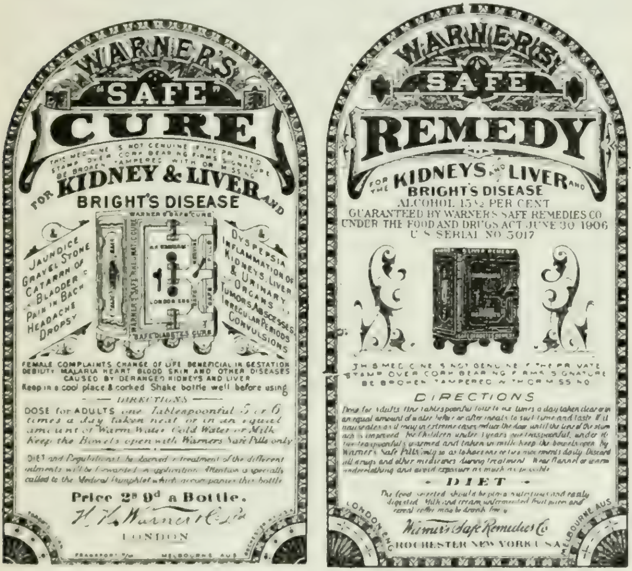
> "Put some morning urine in a glass or bottle; let it stand for twenty-four hours. If then it is milky or cloudy or contains reddish brick-dust sediment, or if particles or germs float about in it, your kidneys are diseased. This is the supreme moment when you should begin to take Warner's Safe Cure to arrest all these unnatural conditions, for they are the unmistakable symptoms of kidney disease."

They are "unmistakable symptoms" of nothing of the sort. Practically any normal urine from a perfectly healthy individual will become more or less cloudy after standing twenty-four hours. "Brick-dust sediment" indicates nothing more serious than a concentrated urine and is not an "unmistakable symptom" of "kidney disease."

At various times this nostrum has been analyzed and the composition of the product has been described. According to a quotation appearing in the report of the Australian Royal

Commission on Secret Drugs, Cures and Foods, the following formula for Warner's "Safe Kidney and Liver Cure" was furnished the German government in accordance with the law:

Extract lycopus virginiana	308	grains
Extract hepatica (herb)	322	grains
Extract gaultheria	7½	grains
Potassium nitrate	39	grains
Alcohol (90 per cent.)	2½	ounces
Glycerin	10	drams
Water sufficient to make	1	pint



WARNER'S "SAFE" CURE

FOR KIDNEY & LIVER AND BRIGHT'S DISEASE

JAUNDICE GRAVEL STONE CATARRH OF BLADDER &c PAIN IN BACK HEADACHE DROPSY

DYSPEPSIA INFLAMMATION OF KIDNEYS, LIVER & URINARY ORGANS TUMORS ABSCESSES IRREGULAR PERIODS CONVULSIONS

FEMALE COMPLAINTS CHANGE OF LIFE BENEFICIAL IN GESTATION DEBILITY MALARIA HEART BLOOD SKIN AND OTHER DISEASES CAUSED BY DERANGED KIDNEYS AND LIVER

Keep in a cool place & corked Shake bottle well before using

DIRECTIONS

DOSE for ADULTS one Tablespoonful 5 or 6 times a day taken neat or in an equal amount of Warm Water Cold Water or Milk Keep the Bowels open with Warner's Safe Pills only

Price 2s 9d a Bottle.

H. H. Warner & Co. Ltd.

LONDON

MELBOURNE AUS

WARNER'S SAFE REMEDY

FOR THE KIDNEYS AND LIVER AND BRIGHT'S DISEASE

ALCOHOL 15½ PER CENT

GUARANTEED BY WARNER'S SAFE REMEDIES CO UNDER THE FOOD AND DRUGS ACT JUNE 30 1906 U S SERIAL NO 5017

DIRECTIONS

DIET

Warner's Safe Remedies Co

ROCHESTER NEW YORK U S A

LONDON ENG

MELBOURNE AUS

Reduced facsimiles of the Warner labels as used in the United States (on right) and in the British Isles (on left) after the passage of the Food and Drugs Act. Notice that the "Cure" became a "Remedy" in the United States and the range of diseases for which the stuff is, or was, recommended is much smaller on this side of the Atlantic.

From the formula given above, it will be seen that the essential drugs in the nostrum are alcohol and potassium nitrate. In 1907 the North Dakota Agricultural Experiment Station analyzed the stuff and it, too, found potassium nitrate and alcohol as, also, did the chemists of the British Medical Association in 1909. Still more recently the chemists of the Laboratory of the American Medical Association examined Warner's Safe Remedy with the following results:

LABORATORY REPORT

One bottle of Warner's Safe Remedy, manufactured by the Warner's Safe Remedies Co., Rochester, N. Y., was submitted to the laboratory for examination. The bottle contained a brown murky liquid, having an aromatic flavor, the odor of oil of wintergreen being quite pronounced. The specific gravity of the liquid at 15.6 C. was 1.0653. Qualitative tests demonstrated the presence of potassium, trace of sodium, nitrate, glycerin, alcohol, and extractive matter.

Quantitative estimations yielded the following:

Alcohol (by volume)	14.40 per cent.
Glycerin (by weight)	7.72 per cent.
Pot. nitrate (calculated from 0.68 per cent. potassium)	1.75 per cent.

Each fluidounce (two tablespoonfuls) contains essentially 4.5 c.c. of 95 per cent. alcohol, 2 c.c. (½ fluidram) glycerin and .55 gm. (8½ grains) potassium nitrate with extractive matter.

THE JOURNAL, in commenting on this nostrum, concluded as follows:

"Here, then, we have a preparation sold inferentially for the cure of Bright's disease and consisting essentially of alcohol, glycerin and potassium nitrate, with extractives. Alcohol, of course, is contra-indicated in inflammatory diseases of the kidney. Potassium nitrate is a kidney irritant and would tend to aggravate any inflammation that might exist. The label on the bottle of Warner's Safe Remedy declares the presence of 15.5 per cent. alcohol and recommends a dosage of one tablespoonful four to six times a day. The circular wrapped around the bottle recommends "one tablespoonful six or eight times a day." Taken at the maximum dose recommended, one large (pint) bottle of Warner's Safe Remedy would last four days. Such a bottle of Warner's Safe Cure contains an amount of alcohol equivalent to the alcohol in 5 ounces of whiskey. This means that the person suffering from Bright's disease who buys Warner's Safe Remedy and takes it according to directions may get the equivalent of 5 ounces of whiskey every four days. In addition to this he may also be getting a daily dose of 34 grains of potassium nitrate to irritate the kidneys further.

"Not only, then, will Warner's Safe Remedy not cure Bright's disease, but it may hasten the death of the sufferer who takes it. Those who, suffering from diseases of the kidney, rely on Warner's Safe Remedy will not only be cruelly defrauded, but will, without question, shorten their lives."

Details of Analysis

Alcohol.—Alcohol was determined according to the method described in "Official and Provisional Methods of Analysis, Bureau of Chemistry, U. S. Dept. of Agric., page 95." The specific gravity of 100 c.c. of the distillate obtained from 50 c.c. of the original was 0.9899. This is equivalent to 14.40 per cent. absolute alcohol by volume.

Glycerin.—The method used is described in "Food Inspection and Analysis (3rd edition), Leach-Winton," page 703. Twenty-five c.c. of the sample gave 2.0564 gm. glycerin. This is equivalent to 7.72 per cent. by weight.

Potassium.—(*A*) 10 c.c. of sample, after addition of sulphuric acid, was heated to ignition, the mass triturated with water, and washed well. Platinic chlorid solution was added to the filtrate, and this treated in the usual manner. The potassium was weighed as Pt. Weight of Pt = 0.1839 gm. This is equivalent to 0.69 per cent. K. (*B*) The sample was dried, hydrochloric acid added, dried again and heated until well charred on electric stove. The potassium chlorid was extracted and K weighed as K_2PtCl_6. Weight of K_2PtCl_6 = 0.4429 gm. This is equivalent to 0.67 per cent. K.

Department
of
Pharmacology
University
of
Toronto

PRUNOIDS

(*Abstracted, with additions, from The Journal A. M. A., Jan. 2, 1915, p. 71*)

Prunoids are tablets put out by the Sultan Drug Company, St. Louis. They are said to be:

> "Made of Phenolphthalein (one and one-half grains in each), Cascara Sagrada, De-emetinized Ipecac and Prunes."

A specimen of Prunoids was examined and the following report published in THE JOURNAL:

"From an examination of Prunoids it is concluded that the amount of cascara or extract of cascara in the preparation is very small. Also the quantity of 'de-emetinized ipecac' is insignificant. The claim is made:

"The levulose of prunes, a constituent of Prunoids, is hygroscopic and thus when brought into contact with the saliva of the mouth or contents of the stomach, disintegrates and prompt medication is insured."

"Actually the amount of prunes which may be present in Prunoids is negligible. For all practical purposes, therefore, Prunoids are phenolphthalein."

Details of Analysis

Phenolphthalein.—A tablet weighed 0.5448 gm. This was powdered, extracted with alcohol, the solution evaporated, the residue dried at 100 C. and weighed. The weight found was 0.3407 gm. or 62.54 per cent. of the weight of material taken. The residue was dissolved in dilute potassium hydroxid solution, an excess of iodin solution added and the solution acidified with hydrochloric acid. The precipitate of tetra-iodophenolphthalein was collected in a weighed Gooch crucible, dried at 100 C. and weighed. The weight found was 0.2004 gm., equivalent to 0.0814 gm. of phenolphthalein, or 1.27 grain per tablet.

Cascara. — The filtrate from which the tetra-iodophenolphthalein had been removed as above described was treated with a slight excess of sodium sulphite to remove excess of iodin, the solution shaken with chloroform, the solvent evaporated and the residue treated with dilute potassium hydroxid solution. No permanent color was obtained, indicating absence of more than traces of cascara extracts. The entire process was repeated using six tablets. The results were still negative. The test used by Bailey (*Jour. Indust. and Engin. Chem.*, 1914, vi, 320) for distinguishing chrysophanic acid of rhubarb from phenolphthalein was then tried on the alcoholic extract of Prunoids. By his method the dealcoholized, faintly acidified preparation is shaken with ether, and the solvent layer washed with very dilute ammonia water. The alkaline solution is allowed to stand over night, by which the colored compounds of haematoxylon and curcuma, if present, fade. The solution is then acidified and shaken with ether. Only chrysophanic acid and phenolphthalein pass into the solvent. The ether is evaporated and the residue boiled with zinc dust and potassium hydroxid solution until the red color has entirely disappeared. By this treatment chrysophanic acid is reduced, the solution becoming yellowish, and phenolphthalein is reduced to phenolphthalin. The solution is diluted with water, or a drop of hydrogen peroxid solution is added. A cherry-red color appearing at once indicates chrysophanic acid. Under these conditions phenolphthalin is not oxidized. While this test was originally devised for detecting rhubarb extracts in presence of phenolphthalein, it has been found (*Am. Jour.*

Pharm., 1914, lxxxvi, 448) to work well with extractives from cascara and some other emodin-bearing drugs. By the Bailey test the presence in Prunoids of a very small quantity of an emodin-bearing drug was indicated. The presence of small quantities of cascara extract in Prunoids is therefore probable.

De-Emetinized Ipecac.—Extracts of ipecac may be deprived of emetin by treatment with potassium hydroxid solution and extraction with ether. The solvent is removed, the alkaline solution acidified, made alkaline with ammonia water and again extracted with ether. The cephaelin is removed by this treatment. If the extraction be continued using chloroform as solvent the psychotrin may be removed. De-emetinized ipecac should, therefore, give tests for cephaelin. Hence if Prunoids contain de-emetinized ipecac in appreciable quantities the preparation should give tests for cephaelin on appropriate treatment. A number of the tablets were powdered and extracted with alcohol which contained a trace of hydrochloric acid. The solution was evaporated to a small volume, the residue diluted with water, the mixture filtered, the filtrate made alkaline with ammonia water and shaken with ether. The solvent was allowed to evaporate spontaneously, the residue taken up with acidulated water and the usual alkaloidal reagents applied to the solution. The results were negative. It is evident, therefore, that de-emetinized ipecac can not be present in Prunoids in more than very small amounts.

TRI-IODIDES, THREE CHLORIDES AND MAIZO-LITHIUM

(Abstracted, with additions, from The Journal A. M. A., Feb. 6, 1915, p. 528)

These three preparations are sold by the Henry Pharmacal Co. (J. F. Ballard, proprietor) of St. Louis. Each was examined and a report on each published in The Journal.

Laboratory Report on Tri-Iodides

A trade package of Henry's Tri-Iodides purchased in 1910 bore the following formula on the label:

"Colchicin, 1-20 grain,
"Phytolaccin, 1-10 grain,
"Solanin, 1-3 grain,
"Sodium Salicylate, C. P., 10 grains,
"Iodic Acid (equal to 7 3-5 gr. of Iodine) in two fluid drachms of Aromatic Cordial."

In the circular which was wrapped with the bottle the wording of the formula differs somewhat from the foregoing, "iodic acid" of the label being replaced by "hydro-iodic acid." While the label on the bottle named "phytolaccin" as one of the constituents the label on the carton which contained the bottle gave "decandrin." The following formula appears on a trade package purchased June, 1914:

"Colchicine, 1-200 Grain,
"Phytolacca, 1 1-5 Grain,
"Mydriatic Alkaloids, 1-500 Grain,
"Sodium Salicylate, 3 1-2 Grain.
"Iodic Acid (equal to 7-125 Grain of Iodine) in two fluid drachms."

The differences between the formulas are striking. Colchicin has been reduced from $^1/_{20}$ grain to $^1/_{200}$ grain; sodium salicylate from 10 grains to 3½ grains; iodin (claimed to be present as iodic acid) from 7/32 grain to 7/125 grain. "Phytolaccin" ("Decandrin") has been replaced by "Phytolacca" and "Solanin" by "Mydriatic Alkaloids." While the formula for the preparation has been changed, the circular accompanying the package still refers to "solanin" (in some parts of the circular wrongly spelled "salonin") and "phytolaccin." As no principle having the characteristic effects of poke-root is known to have been isolated, the terms "decandrin" and "phytolaccin" are meaningless.

The circular states that solanin is an alkaloid obtained from the sprouts of *Solanum tuberosum*, but wrongly calls this plant "bittersweet" instead of potato. At the market price the amount of solanin claimed, according to the old formula, to be present in a bottle of Tri-Iodides, would cost $1.60, although a bottle of the preparation sold at wholesale for 67 cents.

Tri-Iodides is a dark brown, mobile liquid having a faint clove-like odor and a mawkish, sweet taste. Salicylate was found in considerable amounts. Traces of alkaloids were found, a portion of which appeared to be colchicin. Iodic acid and its salts were absent, although claimed by the formula to be present. Potassium iodid was present. Determinations of the iodin by distillation with ferric ammonium sulphate solution and sulphuric acid indicated the presence of about 1.68 gm. of iodin (equivalent to 2.18 gm. of potassium iodid) in each 100 c.c. of the preparation. This is equivalent to about 7.65 grains of iodin per fluidounce, or more than thirty-four times the amount claimed by the formula on the bottle. An approximate determination of the salicylic acid by extraction of the acidified preparation with ether and evaporation of the solvent indicated about 2.67 gm. in 100 c.c., equivalent to 3.09 gm. of sodium salicylate, or about 14.11 grains per fluidounce. Since the amount of sodium salicylate claimed is 3.5 grains in 2 fluidrams or 14 grains in each fluidounce, the amount found agrees essentially with the claims.

Details of Analysis

Iodic Acid or Iodates.—According to the formula claimed for Tri-Iodides, iodic acid is an ingredient of the preparation. The negative results obtained by each of the following tests were considered as demonstrations of the absence of iodic acid or an iodate. Some of the solution was acidified with dilute hydrochloric acid, a few drops of potassium iodid solution added and the mixture shaken with chloroform. No violet color in the chloroform was produced. Another portion of the material was acidified and a dilute solution of morphin sulphate added. On shaking with chloroform no violet color was given to the chloroform layer. Controls to which small quantities of potassium iodate had been added gave violet chloroformic solutions by each test. Controls containing iodic acid also gave positive reactions for liberated iodin.

Colchicin.—A portion of the material was rendered alkaline with ammonia water and the solution shaken with ether. The solvent was washed with water and evaporated to dryness at ordinary temperature. The residue was taken up in acidulated water, the solution filtered and the acid filtrate shaken with ether. On evaporation of the solvent a faintly yellow residue remained which gave a pale-yellow solution on treatment with dilute sulphuric acid. This solution had a bitter taste and gave a yellowish precipitate with mercuric potassium iodid solution. The amount of alkaloid obtainable was too small to obtain the characteristic color reactions with fuming nitric acid and ferric chlorid solution.

Potassium Iodid.—A measured portion of the material was diluted with its volume of water and the diluted solution evaporated to half its volume. Sufficient concentrated sulphuric acid was then added to bring the concentration to about 50 per cent., 5 gm. of ferric ammonium sulphate were added and the mixture distilled in a slow current of air into a solution of potassium iodid, according to the method described in Sutton's "Volumetric Analysis," ed. 8, p. 231. The iodin was then titrated with tenth-normal sodium thiosulphate using starch test solution as indicator. The iodin from 10 c.c. of the material required 13.33 c.c. of tenth-normal sodium thiosulphate, equivalent to 1.6783 gm. of iodin in each 100 c.c., or 34.17 times the amount claimed. This is equivalent to 2.184 gm. of potassium iodid per 100 c.c. of the material.

Sodium Salicylate. — This was determined by calculation from the amount of salicylic acid found by extraction with ether. The alkaline solution from which the colchicin had been extracted was evaporated somewhat, cooled, acidified, shaken with ether, the solvent washed, evaporated and the residue dried and weighed. The salicylic acid from 25 c.c. of the material weighed 0.6669 gm., or 2.6676 gm. per 100 c.c. This is equivalent to 3.0931 gm. of sodium salicylate in each 100 c.c., or about 14.11 grains in each fluidounce. The claimed amount of sodium salicylate is 14 grains per fluidounce.

Laboratory Report on Three Chlorides

Three Chlorides (Henry) is advertised as:

> "An oxygen-carrying ferruginous preparation, suitable for prolonged treatment of children, adults and the aged. Indicated in anemia and convalescence from acute diseases and surgical operations."

It is claimed that each fluidram of Henry's Three Chlorides contains:

"Mercuric Bichlorid	1-72 Gr.
"Arsenic Chloride	1-40 Gr.
"Proto-Chloride Iron	2-25 Gr.

". . . in a cordial of Calisaya Alkaloids."

The preparation is a pale yellow, clear solution having an odor of alcohol. The addition of potassium ferricyanid solution does not produce any blue coloration, thus demonstrating the absence of ferrous chlorid (iron protochlorid). Instead potassium ferrocyanid solution produces at once an intense blue precipitate and potassium sulphocyanate solution an intense red coloration, thus proving the presence of iron in the ferric condition. It is obvious that the claimed superiority of Three Chlorides over preparations containing ferric iron is absurd. Since it contains iron in the ferric condition, Three Chlorides decomposes soluble iodids with the liberation of free iodin. The assertion that it is a suitable "vehicle" for the administration of iodids is likely to lead the physician unwittingly to administer free iodin.

Details of Analysis

The preparation "Three Chlorides" is claimed to contain 1/72 grain of mercuric chlorid, 1/40 grain of arsenic chlorid and 2/25 grain of iron protochlorid in each dram. Examination demonstrated that the arsenic was present in the arsenous condition and the iron in the ferric state.

Mercuric Chlorid.—Mercuric chlorid was determined as follows:

> A few drops of hydrochloric acid was added to a measured volume of the preparation and hydrogen sulphid passed in for a few minutes. The mixture was warmed on the steam bath and more hydrogen sulphid passed in until precipitation was complete. The mixture was filtered through a Gooch crucible, the precipitate washed with water containing traces of hydrogen sulphid and hydrochloric acid and the arsenous sulphid dissolved from it by treatment with yellow ammonium sulphid. The crucible containing the residue of mercuric sulphid was placed in a reflux apparatus and boiled for two hours with a mixture of diluted hydrochloric acid containing a little nitric acid. The mixture was cooled, filtered and the apparatus, asbestos and crucible well washed with water. The filtrate and washings were united, the mercury precipitated with hydrogen sulphid, the mercuric sulphid collected in a weighed Gooch crucible, washed successively with water, alcohol and carbon disulphid, dried at 100 C. and weighed.

From 250 c.c. of the solution 0.0453 gm. of mercuric sulphid was obtained, equivalent to 0.0211 gm. of mercuric chlorid in 100 c.c. This is equivalent to 0.0964 grain per fluidounce, or 86.81 per cent. of the claimed amount.

Arsenic.—The ammonium sulphid solution of arsenous sulphid, obtained as above described, was boiled for two hours in a reflux apparatus with diluted hydrochloric acid containing a little nitric acid. The solution was filtered, the filtrate neutralized with ammonia water and evaporated to small bulk, an excess of magnesia mixture added, the mixture allowed to stand over night, the precipitate collected, dried, heated and weighed as magnesium pyroarsenate. From 250 c.c. of the preparation 0.875 gm. of magnesium pyroarsenate was obtained, equivalent to 0.0408 gm. of arsenous chlorid per 100 c.c., or 93.14 per cent. of the amount claimed.

Iron.—The filtrate from which the mixed arsenous and mercuric sulphids had been removed was made alkaline with ammonia water, more hydrogen sulphid was passed in and the precipitate of ferrous sulphid collected on a filter. The precipitate was dissolved in warm, dilute hydrochloric acid containing some nitric acid and the solution evaporated nearly to dryness. This concentrated solution was diluted with water, the diluted solution heated and made alkaline with ammonia water. The precipitate was washed, dissolved in warm, dilute hydrochloric acid and the iron again precipitated as ferric hydroxid with ammonia water. The precipitate was collected, dried, heated and weighed as ferric oxid in the usual way. The ferric oxid from 250 c.c. of the material weighed 0.2012 gm., equivalent to 0.0563 gm. of iron in each 100 c.c. This would be equivalent to 0.5816 grain of ferrous chlorid in each fluidounce, were the iron present in the ferrous state. The claim of 2/25 grain of protochlorid of iron in each dram is equivalent to 0.64 grain in each fluidounce. The iron found, therefore, if calculated to ferrous chlorid, would amount to 90.88 per cent. of the amount claimed.

Laboratory Report on Maizo-Lithium

The promoter of Maizo-Lithium makes the following statement upon the label concerning the composition of the preparation:

> "Each fluid drachm contains two grains maizenate of lithium."

The following is also found in a circular which is enclosed with the trade package of Maizo-Lithium:

> "Maizo-Lithium, the remarkable uric acid solvent, is a nascent chemic union of maizenic acid, obtained from green corn silk, with the alkaline base lithium forming maizenate lithium, of which the mother liquid carries two grains to each drachm."

Standard works on organic chemistry and pharmacology, such as Beilstein's Organische Chemie and Cushny's Pharmacology and Therapeutics, do not mention maizenic acid. Neither is it mentioned in comprehensive bibliographies of phyto-chemical investigations such as Huseman-Hilger's Die Pflanzenstoffe or Wehmer's Die Pflanzenstoffe. The first to use the term appears to have been a Dr. Vautier (*Arch. méd. belg.*), but his publication is not available to the laboratory. Rademacher and Fischer (*Amer. Jour. Pharm.*, 1886, lviii, 369) claim to have isolated the substance from green corn-silk, but the record of their work is unsatisfactory and indefinite and therefore their results could not be verified; it seems unlikely, however, that they isolated a pure proximate principle.

Examination of Maizo-Lithium demonstrated the absence of bromids, chlorids, phosphates, sulphates, acetates, benzoates, salicylates and tartrates—combinations in which lithium might be expected to be present. The presence of a citrate, however, was shown by the usual tests. Lithium and sodium were present. Free acid was absent. Determination of lithium citrate and of sodium citrate indicated the presence of a total of about 3.7 gm. of these two salts in each 100 c.c. of the preparation, or about 2.1 grains in each fluidram. About 25 per cent. of the total salts appeared to be lithium citrate. The examination, therefore, does not demonstrate the presence of "maizenate of lithium," but does show that Maizo-Lithium contains a mixture of lithium citrate and sodium citrate. Tests for citric acid and citrates were made on a commercial specimen of fluidextract of corn-silk. The results were negative, although the preparation had an acid reaction to litmus. The presence of maizenate of lithium in Maizo-Lithium—in fact, its actual existence—thus failed of demonstration. In view of this fact, it was felt that the burden of proof rested on the promoter of Maizo-Lithium to supply some satisfactory evidence with regard to this substance. The following letter was, therefore, sent to James F. Ballard:

> "According to the label on a recently purchased bottle of Maizo-Lithium, each fluidram of this preparation contains 2 grains of 'maizenate of lithium.' From an examination made in this laboratory we are inclined to conclude that this statement is not in accordance with the facts. A search of chemical and pharmaceutical publications does not reveal that such a compound as 'maizenate of lithium' has ever been isolated and described and we are very much inclined to question its existence. We should be pleased to receive from you any evidence which you may care to send in substantiation of your claim in regard to the content of 'maizenate of lithium' in Maizo-Lithium—particularly a specimen of 'maizenate of lithium' or the method by which it is produced."

While this letter was sent Oct. 13, 1914, no evidence has been submitted up to date (January, 1915) to substantiate the asserted presence of maizenate of lithium in Maizo-Lithium.

Details of Analysis

Lithium and Sodium.—Lithium was separated from sodium and its quantity approximately determined by the method described for the determination of lithium in mineral waters (U. S. Department of Agriculture, Bulletin of Chemistry, Bull. 91, p. 29). Fifty c.c. of the material was evaporated to dryness and the residue heated until most of the carbon had been dissipated. The residue was treated with hot, dilute hydrochloric acid and the mixture filtered. The filter paper and insoluble residue were dried, burned and the residue digested with hot, dilute hydrochloric acid as before.

The mixture was filtered, the filtrates united and evaporated to dryness. The residue was heated to 120 C. to dehydrate any silica present, the residue taken up with hot, dilute hydrochloric acid, the mixture filtered and a slight excess of barium chlorid added to the hot filtrate. After standing over night the barium sulphate was removed by filtration, and the filtrate evaporated to dryness. The residue was taken up with water and a few cubic centimeters of barium hydroxid solution added. After standing over night the mixture was filtered and the filter well washed. The filtrate and washings were treated with ammonia water, ammonium carbonate and a little ammonium oxalate solution to remove barium and calcium. The mixture was allowed to stand over night and the precipitate removed by filtration and washed. The filtrate and washings were concentrated to small volume and the solution again filtered. The filtrate was evaporated to dryness and the ammonium salts expelled from the residue by heat. The residue was taken up in a little water and the solution filtered through a small filter into a platinum dish, a few drops of hydrochloric acid added, the solution evaporated to dryness, the residue heated to beginning redness and weighed as the mixed chlorids of lithium and sodium. The combined chlorids were dissolved in water, the solution placed in a small beaker and evaporated to about 5 c.c. About 30 c.c. of amyl alcohol were added and the mixture boiled until all of the water had been removed. A drop of hydrochloric acid was added, and the mixture boiled until about 15 c.c. remained. The amyl alcohol was then filtered into a weighed platinum dish, the filter and insoluble residue washed with amyl alcohol, the solvent removed by evaporation, an excess of sulphuric acid added, the mixture heated to low redness and the residue cooled and weighed as lithium sulphate. From the weight found 0.0017 gm. was subtracted to correct for the solubility of sodium chlorid in the amyl alcohol. The remainder was calculated to lithium citrate. The residue insoluble in amyl alcohol was dissolved in water, the solution evaporated to dryness, an excess of sulphuric acid added, the mixture heated to low redness, and the residue cooled and weighed as sodium sulphate. To the weight found a correction of 0.0017 gm. was added. The results were then calculated to sodium citrate. From 50 c.c. of the material 0.9010 gm. of mixed lithium chlorid and sodium chlorid was obtained. From this 0.4153 gm. of lithium sulphate (corr.) was obtained, equivalent to 0.7094 gm. of lithium citrate ($Li_3C_6H_5O_74H_2O$), or 1.4188 gm. per 100 c.c. From the mixed lithium chlorid and sodium chlorid residue 0.6904 gm. of anhydrous sodium sulphate was obtained, equivalent to 1.1567 gm. sodium citrate ($Na_3C_6H_5O_7.5\frac{1}{2}H_2O$), or 2.3113 gm. per 100 c.c. The mixed lithium chlorid and sodium chlorid from 50 c.c. of the material weighed 0.9416 gm. From this 0.4282 gm. of lithium sulphate was obtained, equivalent to 0.7314 gm. of lithium citrate, or 1.4628 gm. per 100 c.c. From the mixed lithium chlorid and sodium chlorid 0.6931 gm. of sodium sulphate was obtained, equivalent to 1.1712 gm. of sodium citrate, or 2.3424 gm. per 100 c.c. The average value for lithium citrate found is 1.4408 gm. per 100 c.c. and for sodium citrate 2.3279 gm. per 100 c.c. The total of citrate salts found amounts to about 3.77 gm. per 100 c.c.

As the separation of lithium from sodium by the method used above is not considered to be very accurate it was thought worth while to test the residue of lithium sulphate for sodium and the residue of sodium sulphate for lithium. By the flame test the foreign metal was found to be present in considerable amounts in each case. A second method was therefore tried.

Twenty-five c.c. of the material was evaporated to small volume with an excess of sulphuric acid and the residue ignited at a low temperature until most of the carbon had been dissipated. The residue was treated with hot dilute hydrochloric acid and the mixture filtered. The filter paper and insoluble residue were dried, burned, and the residue digested with hot, dilute hydrochloric acid as before. The mixture was filtered, the filtrates united and evaporated to dryness. The residue was heated to 120 C. to dehydrate any silica present, taken up in water and filtered. Previous experience with the material having shown the practical absence of calcium and phosphates, after the treatment above described the filtrate was evaporated with a little sulphuric acid, the residue heated and weighed as the mixed sulphates of sodium and lithium. This residue of mixed sulphates from 25 c.c. of the material weighed 0.5887 gm. The residue was taken up in water, an excess of barium chlorid solution added to the solution, the precipitate collected, heated and weighed in the usual manner. The barium sulphate from 25 c.c. of the material weighed 1.0368 gm. This is equivalent to 0.4355 gm. of anhydrous sulphuric acid. The respective amounts of lithium sulphate and of sodium sulphate in the residue of mixed sulphates as weighed were then found by calculation according to method described below:

Since 1 gm. of anhydrous lithium sulphate is equivalent to 0.8899 gm. of absolute sulphuric acid and 1 gm. of anhydrous sodium sulphate is equivalent to 0.6899 gm. of anhydrous sulphuric acid, the respective weights of the two salts may be found by solving the following equation:

$$0.8899\,x + 0.6899\,(w - x) = c$$

In which

w = the weight of the mixed alkali sulphates found.

x = the weight of anhydrous lithium sulphate in the mixture.

$(w - x)$ = the weight of anhydrous sodium sulphate in the mixture.

c = the weight of anhydrous sulphuric acid found.

Substituting the values obtained in the analysis, x has a value of 0.1469 gm. of lithium sulphate and $(w - x)$ is equivalent to 0.4418 gm. of sodium sulphate. These values are equivalent respectively to 1.0042 gm. of lithium citrate and 2.9608 gm. of sodium citrate per 100 c.c.

Citric Acid.—The alcohol from 50 c.c. of the preparation was removed by evaporation and the solution diluted to about 500 c.c. with water, a slight excess of solution of basic lead acetate was added, the mixture filtered after standing over night and the precipitate washed, first on the filter and afterward by suspension in water and second filtration. The washed precipitate was suspended in water and the mixture saturated with hydrogen sulphid. The lead sulphid was removed by filtration, the precipitate washed well, the filtrate and washings united, the solution evaporated to about 100 c.c. and the acidity determined by titration with normal sodium hydroxid, using phenolphthalein as indicator. The acid from 50 c.c. of the material required 14.36 c.c. of normal sodium hydroxid, equivalent to 0.998 gm. of crystallized citric acid, or 1.996 gm. in each 100 c.c. If the citric acid contained in 1.44 gm. of crystallized lithium citrate (1.072 gm.) be added to the amount contained in 2.3279 gm. of sodium citrate (1.3688 gm.) the sum is 2.44 gm. This is a considerably larger amount than was found by titration.

BETUL-OL

(Abstracted from The Annual Reports of the Council on Pharmacy and Chemistry, A. M. A., 1914, p. 62)

Betul-ol, said to be "Manufactured in the New York Laboratories of the Anglo-American Pharmaceutical Co., Limited," is sold by E. Fougera and Co., New York, as an analgesic and antirheumatic. It is a transparent dark green liquid having a strong odor of methyl salicylate.

INDEFINITE FORMULA

In general only vague and meaningless or misleading statements are made as to the composition of Betul-ol, thus:

". . . a menthol-methyl oleo-salicylate derived from the plant *betula lenta.*"

"Betul-ol is a methyl-oleo-salicylate containing chloro-menthol."

". . . betul-ol (menthol-methyl-oleo-salicylate comp.)."

". . . betul-ol, or chloro-menthol-methyl-salicylate."

"This salicylate liniment is the methyl ester of salicylic acid in combination with menthol."

"A 2 per cent. solution of menthol in a methyl ester of the salicylic radical . . ."

"Betul-ol is a chloro-menthol methyl salicylate liniment."

The following, which appeared to be a definite statement of composition was given on a return-postal card recently sent out:

> "Betul-ol is a 2% solution of menthol and 2% of chloral in methyl salicylate."

The untrustworthiness of this formula, however, has been demonstrated by the following tests:

On heating Betul-ol on the water-bath until the weight became approximately constant a residue of 8.74 per cent. by weight remained. This residue was a dark brown oily liquid and had an acid reaction. It appeared to consist for the most part of free oleic acid. Titration with normal potassium hydroxid and calculation of the results to oleic acid indicated about 92 per cent. of this residue to be oleic acid.

IODALIA

(*Abstracted, with additions, from the Annual Reports of the Council on Pharmacy and Chemistry A. M. A., 1914, p. 69*)

At the request of the Council on Pharmacy and Chemistry the laboratory examined Iodalia and reported as follows:

Iodalia, said to be made by "Laboratory: 12 rue Vanin, Paris, France," and sold in the United States by Geo. J. Wallau, is stated to be "Saccharated Iodine" containing its iodin in organic combination with tannin and because of this form of combination the iodin in Iodalia is said to be "always well tolerated;" the claim is made that it "cannot cause the well known symptoms of iodism." As regards the iodin content of Iodalia, the label declares that

> "Each teaspoonful contains 0.06 centigrammes of Iodine . . ."

and the circular wrapped with the bottle emphasizes that this amount is "regulated with mathematical precision." While thus the preparation is said to contain only six-tenths of a milligram or one-hundredth grain of iodin, a circular entitled "Intensive Iodine Medication" asserts that 5 gm., or a teaspoonful, contains 0.06 gm., or one grain iodin. According to the label, Iodalia is

> "Indicated in the same cases in which iodine is usually employed."

Iodalia is a light-brown, sweet granular powder, evidently composed chiefly of sugar, and is very hygroscopic (thus contradicting claims of superior permanence), having a slightly acidulous taste. Its aqueous solution is acid in reaction and when treated with an excess of silver nitrate test solution, a precipitate forms at once and, the precipitate having been removed by filtration, the clear liquid yielded no iodin when boiled with ferric sulphate and diluted acid or when previously treated with zinc in an alkaline solution and then boiled with ferric sulphate and acid.[1]

From these experiments it is concluded that when Iodalia is dissolved in water its iodin will be in the form of iodid ions or in a form which yields iodid ions very readily—just as was found in the case of the iodin contained in Nourry Wine. From these findings it is evident that when Iodalia is administered, the iodin will be present in the gastric fluids in the form of iodids and will enter the circulation as alkali iodid just as is the case when potassium iodid is administered.

To determine the iodin content quantitatively the method of Douris (*Chem. Centralbl.*, 1909, i, 2010) for determining the iodin content of the official French iodo-tannin syrup was used. It consists simply in dissolving the substance in water, diluting, adding an excess of silver nitrate, heating on the water bath, then adding an excess of nitric acid and filtering and washing on a tared Gooch, drying and weighing the resulting silver iodid. By this method the following results were obtained: (*a*) 4.4792 gm. material yielded 0.0769 gm. silver iodid equivalent to 0.92 per cent. iodin; and (*b*) 4.4760 gm. material yielded 0.0741 gm. silver iodid, equivalent to 0.90 per cent. iodin, indicating the presence of 0.9 gm. iodin in 100 gm. of Iodalia, or 0.0445 gm. (¾ grain) in 5 gm., equivalent to 75 per cent. of claim. This indicates that the statement of iodin content on the label is incorrect—probably due to a typographical error. The assertion that Iodalia contains 0.06 gm. iodin in 5 gm. and that this amount is "regulated with mathematical precision" is not confirmed.

Based on the foregoing findings the Council made the following comment:

"The chemist's report that, for all practical purposes, the iodin in Iodalia behaves as do ordinary iodids, rules out of court the claim of special advantages over inorganic iodid in the peculiar form of organic combination of the iodin in Iodalia. The iodin of Iodalia evidently will enter the circulation in precisely the same form as will the iodin of the inorganic iodids, the use of which the Iodalia advertising propaganda decries. Hence it follows that the advantages claimed for Iodalia in that it is 'always well tolerated' and that it cannot produce 'symptoms of iodism' are due to the small dosage of iodin (0.9 gm. iodin in 100 gm. of Iodalia).

"Incidentally, it may be remarked that the bottle of Iodalia retailing at a dollar contains about 100 gm.; hence it would be necessary to administer more than a bottle to obtain iodin equivalent to 20 grains of potassium iodid. The recommendation that Iodalia is 'indicated in the same cases in which iodine is usually employed' cannot be taken seriously, for the administration of from half a bottle to two or more bottles of Iodalia a day would be disastrous to the patient's digestive organs, if not to his pocketbook."

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[1] Reports Chem. Lab. A. M. A., 1911, iv, 18; 1913, vi, 38.

NOURRY WINE

(Abstracted from the Annual Reports of the Council on Pharmacy and Chemistry, A. M. A., 1914, p. 74)

Nourry Wine, E. Fougera and Co., New York, is one of the so-called iodo-tannin preparations which contain their iodin either in the form of hydrogen iodid or in a loose combination with tannin which readily yields hydrogen iodid.

At the request of the Council the laboratory made an examination to determine the nature of the iodin compound contained in Nourry Wine and reported as follows:

"A specimen of Nourry Wine recently obtained from E. Fougera and Company was examined. When treated with an excess of silver nitrate test solution a precipitate formed at once. The precipitate having been removed by filtration the clear liquid yielded no iodin when boiled with ferric sulphate and dilute acid, or when previously reduced with zinc in an alkaline solution and then boiled with ferric sulphate and acid.[1] These experiments demonstrate that the iodin contained in Nourry Wine is present either in the form of iodid ions or in a form very readily yielding iodid ions."

The Council commented further as follows:

"The claim is made that

> "The Nourry Wine is the one preparation . . . able to introduce into the organism the active metalloid liberated little by little from the organic combination . . .

"As explained in the chemist's report, however, for all practical purposes the iodin in Nourry Wine is present in the form of an iodid. There is no evidence in support of the claim for unique virtues in its iodin content."

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[1] Reports Chem. Lab., A. M. A., 1911, iv, 18; 1913, vi, 38.

PART III

REPORTS NOT PREVIOUSLY PUBLISHED

BERLEDETS

One original box of Berledets, manufactured by the Berledite Company, Chicago, was purchased about April 1. 1914, from a local druggist. The inscription on the box, as well as the wording of the circular, varied greatly as compared with the package examined previously (see JOURNAL A. M. A., Nov. 22, 1913, p. 1917). Information furnished the laboratory, purporting to have originated with the Berledite Company, stated that Berledets were composed of boric acid, hexamethylenamin, potassium acid phosphate, milk sugar and flavoring. In the previous analysis made by us (loc. cit.), phosphates were tested for and *not found,* while hexamethylenamin was not tested for, inasmuch as its employment in a fat-reducing nostrum was not to be expected. Therefore, it was thought not to be without interest to make a second examination of Berledets.

The box contained forty-one tablets, weighing (on an average) about 0.95 gm. (15 grains) and having an odor of cinnamon and peppermint. Qualitatively the presence of the following was demonstrated: uncombined boric acid, a phosphate of potassium, hexamethylenamin, milk sugar, cornstarch and essential oil.

From the quantitative determination of boric acid, hexamethylenamin, potassium phosphate, sugar and starch, it is concluded that the specimen of Berledets examined has essentially the following composition:

Hexamethylenamin	6.0 per cent.
Boric acid	43.3 per cent.
Potassium acid phosphate (KH_2PO_4)	18.3 per cent.
Starch (anhydrous)	16.5 per cent.
Milk sugar (lactose)	15.0 per cent.
Flavoring undetermined	0.9 per cent.
	100.0 per cent.

The present findings differ chiefly from the previous findings by the presence of potassium acid phosphate and the statement that hexamethylenamin is a constituent. One tablet contains approximately 1 grain of hexamethylenamin, 6½ grains of boric acid, 3 grains of potassium acid phosphate, the whole being made up to 15 grains.

Details of Analysis

Boric Acid.—Boric acid was determined by the Gladding distillation method (*Jour. Am. Chem. Soc.*, 1898, xx, 288, Leach, "Food Inspection and Analysis," ed. 3, p. 827). (*a*) 2.4269 gm. of the sample required 16.99 c.c. of normal sodium hydroxid, equivalent to 0.1053 gm. of boric acid (H_3BO_3), or 43.03 per cent. (*b*) 1.0075 gm. of the sample required 7.11 c.c. of normal sodium hydroxid, equivalent to 0.4408 gm. of boric acid (H_3BO_3), or 43.75 per cent.

Hexamethylenamin.—The sample was completely digested with sulphuric acid, and the ammonia determined, by the Kjeldahl method (see Annual Reports of the Chemical Laboratory, A. M. A., 1909, i, 57). The number of cubic centimeters of normal hydrochloric acid, which were neutralized by the ammonia liberated, was multiplied by the factor 0.03479, giving the weight of hexamethylenamin. (*a*) 5.2361 gm. of the sample yielded ammonia which neutralized 9.12 c.c. of normal hydrochloric acid, equivalent to 0.3165 gm. of hexamethylenamin, or 6.04 per cent. (*b*) 5.3084 gm. of the sample yielded ammonia which neutralized 9.21 c.c. of normal hydrochloric acid, equivalent to 0.3197 gm. of hexamethylenamin, or 6.08 per cent.

Phosphate.—The phosphate was precipitated as magnesium ammonium phosphate, the precipitate filtered and washed, the residue dissolved on the filter by dilute hydrochloric acid, the filter washed well and the magnesium ammonium phosphate reprecipitated by the addition of ammonium hydroxid to the filtrate. After standing for eight hours, the precipitate was filtered onto a weighed platinum Gooch crucible, washed well, and the whole ignited to constant weight. (*a*) 1.7414 gm. of the sample gave 0.2613 gm. of magnesium pyrophosphate ($Mg_2P_2O_7$), equivalent to 12.80 per cent. phosphate (PO_4). (*b*) 2.0065 gm. of the sample gave 0.3017 gm. of magnesium pyrophosphate ($Mg_2P_2O_7$), equivalent to 12.82 per cent. phosphate (PO_4).

Potassium.—The sample was incinerated in a platinum dish, the residue leached with water, filtered, the residue placed in the platinum dish, and ignited until all free carbon had disappeared. The ignited mass, after cooling, was triturated with water, and filtered (followed by good washing of the residue) into the original filtrate. The combined filtrate was acidified with hydrochloric acid, and chlor-platinic acid added. The solution was placed on a steam bath and evaporated to a syrupy consistency. A small volume of 80 per cent. alcohol was then added, and after standing, with occasional stirring, for about half an hour, the precipitate was thrown on a filter and washed well. The filter was then punctured, and the residue washed by means of water into a beaker. Hydrochloric acid was added and the solution heated until the precipitate dissolved. The potassium platinic chlorid was then reduced by addition of zinc and the platinum filtered and weighed. The potassium was calculated from the weight of platinum found. A. Weight of sample was 1.1529 gm.; weight of platinum 0.1643 gm.; per cent. of potassium found 5.51. B. Weight of sample was 1.5010 gm.; weight of platinum was 0.2154 gm.; per cent. of potassium found 5.39.

Inasmuch as the potassium found corresponded closely to that calculated from the phosphate determination as one potassium atom for one phosphate radical, it was concluded that the phosphate present was mono-potassium di-hydrogen phosphate.

Starch.—Starch was determined as described in Annual Reports of the Chemical Laboratory A. M. A., 1913, vi, 66. A. Weights of sample 1.8926; weight of starch 0.3137 gm.; per cent. starch found 16.57. B. Weight of sample 1.5010; weight of starch 0.2509 gm.; per cent. of starch found 16.70.

Sugar.—The sugar was dissolved out of 7.9728 gm. and the solution diluted, by repeated washing of the residue, to 50 c.c. (The residue was again treated with 50 c.c. of water, as above, and the solution gave no angular rotation in a 2.1 decimeter tube, showing that all the sugar had been dissolved out at first.) The solution after standing some time, gave an angular rotation of 2.53° in a 2 decimeter polarizing tube. This is equivalent to 0.120 gm. of milk sugar or 15.05 per cent.

DR. W. B. CALDWELL'S SYRUP PEPSIN AND HERB LAXATIVE COMPOUND

Inquiries were received concerning the composition of Dr. W. B. Caldwell's Syrup Pepsin and Herb Laxative Compound (Pepsin Syrup Co., Monticello, Ill.). One writer thought that the therapeutic effects of the preparation were like those of phenolphthalein and inquired whether this substance was present.

Concerning the composition of the remedy the following statement is made in a circular which accompanies the trade package:

> "The natural demand for a digestive preparation in conjunction with a prompt and effective laxative has led to the compounding of pepsin, the greatest digestant of the age, with mild and effective laxative drugs,

containing the virtues of plants known to be the most beneficial to the human system. To combine pepsin with vegetation to make the most effective remedy and meet with the best results has led to the manufacture of the popular remedy,

Dr. Caldwell's Syrup Pepsin and
Herb Laxative Compound

A remedy and combination that has given universal satisfaction."

In 1912 at the Hearings before the Committee on Interstate and Foreign Commerce of the House of Representatives relating to the Food and Drugs Act, Dr. Kebler listed Caldwell's Syrup of Pepsin among the "Products for which False or Fraudulent claims are made" and stated that it is "an aqueous alcoholic solution containing laxatives, flavored with oil of peppermint. Pepsin is absent or not present in appreciable amounts."

In view of the inquiries received and the lack of information concerning the laxative constituents of Syrup Pepsin, it seemed worth while to determine the nature of the laxative ingredients.

Qualitative tests indicated the presence of a senna preparation as the chief laxative ingredient. Phenolphthalein was absent. Incidentally the presence of small quantities of a salicylate, probably sodium salicylate, were noted.

Details of Analysis

Senna.—A portion of the material was diluted with water and shaken with ether. The solvent was evaporated and the residue dissolved in very dilute sodium hydroxid solution. A light red color was produced similar to that given by most emodin-bearing drugs if similarly treated but not purplish-red like the color of phenolphthalein in sodium hydroxid solution. This color disappeared on boiling with dilute sodium hydroxid solution and zinc dust and reappeared after cooling and adding a drop of hydrogen peroxid solution. The absence of bitterness in the ether extract as well as in the original preparation indicated the absence of aloes, cascara and frangula. Partly from these eliminative tests and partly from the color of the ether extract with sodium hydroxid solution it was concluded that a preparation of senna was present in Syrup Pepsin.

Phenolphthalein.—The absence of a purplish-red color in the ether extract after treatment with sodium hydroxid solution was taken to indicate the absence of phenolphthalein. As confirmatory evidence a portion of the material was diluted with water, filtered and the residue (which was small) treated with sodium hydroxid solution. A purplish-red solution was not given.

Salicylic Acid.—The reaction of the solution was very slightly acid toward litmus. A measured portion of the material (50 c.c.) was evaporated on the water bath to a very thick syrup, a few drops of hydrochloric acid added, and the residue extracted with several successive portions of ether. The solvent was evaporated, the residue dissolved in diluted sodium hydroxid, the solution allowed to stand for two hours, and filtered. The filtrate was acidified with hydrochloric acid and shaken with several successive portions of ether. The solvent was washed with water, allowed to evaporate spontaneously, the residue dried over sulphuric acid and weighed. The residue from 50 c.c. weighed 0.0388 gm., equivalent to 0.0776 gm. of crude salicylic acid in each 100 c.c. or 0.09 gm. of sodium salicylate. This salicylic acid was not pure but was contaminated with emodin or emodin-like substances.

DUNHAM'S SPECIFIC

Inquiries having been received concerning the composition of Dunham's Specific for Whooping Cough (Lickes Drug Company, Cleveland, Ohio) a specimen was examined. Qualitative tests demonstrated the absence of most of the medicinal substances usually found in cough and whooping-cough remedies such, for example, as ammonium chlorid, antipyrin, extract of glycyrrhiza, opium derivatives, morphine derivatives and tartar emetic. The preparation appears to be a thick mucilage which has been dyed a violet red color and which contains considerable sugar, a little alcohol and small amounts of suspended matter and flavoring material. The suspended matter appeared to consist for the most part of fragments of vegetable tissue, probably derived from the gum used in preparing the mucilage. The preparation, therefore, appears to be little more than a colored and sweetened mucilage.

ELIMITON (HURWITT)

An Example of the Differentiation of Organic Combined Iodin

Elimiton (Hurwitt), also called "Capsule Reducti Comp.," is placed on the market by one George J. Hurwitt, Ph. G., New York. Elimiton is sold with the claims of being a "fat reducer," and, according to the booklet sent to physicians, should be taken under the physician's direction. A prescription formula, accompanying the booklet, bears the following inscription:

"Each Capsule Represents Approximately

Organic Iodines and Modifiers	5 grs.
Phenyl Salicylate	1 gr.
Pulv. Rhei.	1 gr.
Theine	1 gr."

Specimens of Elimiton were received at the Chemical Laboratory and examined. The capsules contained a brown powder. Examination confirmed the presence of caffein (thein), rhubarb, and phenyl salicylate. The iodin was not present in the inorganic form. In two of the specimens examined, iodin was found to be present, while in a third iodin was not found.

It was also demonstrated that the iodin present was not in a condition otherwise than that peculiar to thyroid or bladderwrack. It is concluded that the iodin compound in Elimiton has the characteristics of thyroid or bladderwrack.

Details of Analysis

Qualitative examinations were made to confirm the presence of the claimed constituents, namely rhubarb, caffein, salol, iodins and in what forms the latter existed. From the tests made, it was concluded that the substances were present as claimed.

Phenyl Salicylate.—Some of the sample was treated with alcohol and filtered. The filtrate was evaporated to dryness, boiled with sodium hydroxid solution and then acidified. The odor of phenol was detected, and the solution also gave the characteristic blue color with ferric chlorid, showing the presence of salicylate.

Rhubarb.—The presence of rhubarb was substantiated as follows: A red color was formed by the addition of alkali to some of the sample. This showed the presence of an emodin-bearing drug, as aloes, cascara, senna or rhubarb. By the color, taste, and smell, aloes, cascara, and senna were eliminated, and it was concluded that rhubarb was present. Examination under the microscope was not satisfactory, as it revealed nothing definite outside of calcium oxalate crystals, and not "well-defined" wood bundles.

Ginger and Magnesium.—Starch grains resembling ginger were found. Magnesium was also present in considerable amounts. This suggests that Pulv. Rhei. Comp., U. S. P., may have been used.

Caffein (Thein).—Some of the sample was triturated with water, filtered, and the filtrate shaken with chloroform. The chloroform extract was filtered through a cotton plug and evaporated to dryness. The residue was dissolved in about 1 c.c. of hydrochloric acid, a little potassium chlorate added, the whole evaporated to dryness and the dish then inverted over a vessel containing ammonia water. The residue acquired a rich purple color.

Iodin.—By treatment of the sample with hydrochloric acid and sodium nitrite, then shaking with chloroform, iodin was not indicated. This would exclude inorganic iodin. Iodin was found to be present, when two different specimens were treated in the following manner: A portion was heated with potassium and sodium carbonates (5 gm.) and Rochelle salt (1 gm.). The mass was extracted with water, the extract acidified and treated with sodium nitrite. Upon shaking the solution with chloroform, it assumed a purple color, thus indicating the presence of iodin. A third specimen, treated as above, did not show the presence of iodin.

A personal communication from Dr. Anderson of the Hygienic Laboratory says:

"Reid Hunt and Atherton Seidell have demonstrated that organic iodin in forms of combination, otherwise than such as thyroid, can be detected by digesting the sample at 100° for several hours with 30 to 50 per cent. sodium hydroxid solution, diluting, acidifying and shaking out with chloroform, after the addition of a few drops of sodium nitrite solution. Under these conditions, desiccated thyroid and bladderwrack extract gave no test for iodin, while a large number of proprietary and organic iodin compounds, alone or mixed with thyroid, gave unmistakable amounts of iodin. The compound sajodin was more resistant to the aqueous caustic than any of the others tested." Specimens of Elimiton treated as above gave no iodin test. A control of sajodin gave the test for iodin.

M. I. S. T. NO. 2 NERVE TONIC

Inquiries were received concerning the composition of a preparation called "M. I. S. T. No. 2 Nerve Tonic." The preparation is recommended

> "For all Nervous Disorders, Mental Depressions, Impotency, and in fact every disease of the Nervous System. . . . For Syphilis or Venereal Diseases, Dropsy, Gout, Rheumatism, Tumors, Ulcers, Scrofula, Swellings, Ulcerated Sore Throat, Erysipelas, Cancer, or Cancerous Tumors, and Inflammation of the Bladder, Stricture and Varicocele."

Purchased specimens of M. I. S. T. No. 2 Nerve Tonic were examined.

The initials "M. I. S. T." are said to stand for "Murray's Infallible System Tonic." The preparation is sold by the M. I. S. T. Co. of Toledo, Ohio. A qualitative examination of M. I. S. T. by the Michigan Dairy and Food Department has been reported ("Fakes and Frauds," p. 4), according to which that preparation contains aloes, cascara and licorice. The *Druggists Circular* (1913, lvii, 688) has also published a note on the last named preparation as follows:

> "In the CIRCULAR for April, 1886, page 87, we stated that a reader had suggested that the following might be the formula for the preparation:
>
> | | |
> |---|---|
> | Powdered aloes | 40 grains |
> | Blue mass | 20 grains |
> | Powdered castile soap | 20 grains |
>
> Make 40 capsules.
>
> The Standard Formulary gives the aloes as above, but instead of blue mass and soap, directs the use of cinnamon and licorice root."

Hiss ("Thesaurus of Proprietary Preparations," p. 199) quotes from the *New Idea* that a mixture of aloes 50, cinnamon 25 and licorice root 25 is similar to Murray's Infallible System Tonic. No information concerning the composition of M. I. S. T. No. 2 Nerve Tonic is available. It should be noted that all of these references apparently refer to M. I. S. T. and not to M. I. S. T. No. 2.

Specimens of M. I. S. T. No. 2 Nerve Tonic were examined. The preparation consisted of brownish-black cylindrical masses each inclosed in a gelatin capsule and having an odor like wintergreen and licorice and a bitter taste. The masses weighed about 0.33 gm. (5 grains) each. The trade package examined, which sells for one dollar, contained thirty-one capsules.

Qualitative tests demonstrated the presence of aloes, metallic mercury, probably introduced in the form of blue mass, powdered glycyrrhiza, powdered althea, starch, traces of calcium, a phosphorus compound, oil of wintergreen and a little sand. Zinc phosphid and nux vomica, two remedies which are frequently put into nostrums for the treatment of "lost manhood," were absent. Iodids and salicylates (except traces of oil of wintergreen), phenolphthalein and the saline purgatives were absent. Soap was not present, at least, not in appreciable amounts. Cascara was not found. A quantitative determination of mercury was made and about 4 per cent. found. From this it is apparent that M. I. S. T. No. 2 Nerve Tonic is essentially an aloes-mercury mixture and whatever therapeutic power it may possess must be due principally to these drugs.

Details of Analysis

Aloes.—Some of the material (the contents of 5 capsules) was treated with 100 c.c. of hot water and the mixture filtered. Tests for aloes were carried out on the filtrate according to Mossler's method (*Pharm. Post,* 1913, xlvi, 313 and 325). The method as used is as follows:

> The filtered solution is heated for thirty minutes on the water bath with 10 c.c. of normal sulphuric acid. The sulphuric acid is then exactly precipitated with barium hydroxid solution, the barium sulphate removed by filtration and the precipitate washed. The filtrate is concentrated to 100 c.c., treated with slight excess of basic lead acetate solution in order to remove coloring matter, and the filtrate treated with sodium sulphate solution to remove excess of lead. The lead sulphate is removed by filtration and the filtrate divided into several portions. One is extracted with benzene, and the benzene layer shaken with very dilute ammonia water. Oxymethylanthraquinones derived from other drugs, which would interfere with the aloin test, should be completely precipitated by lead acetate. If this be the case the ammoniacal layer will be only of the faintest rose color, whereas if precipitation be not complete the ammonia will be of a fine rose-red color. In this case the bulk of the solution must be again treated with basic lead acetate solution and the test repeated. When oxymethylanthraquinones are shown to be completely precipitated another small portion of the filtrate is treated with excess of bromin solution, which, in the presence of aloin, yields a flocculent precipitate. If this reaction be given, confirmation should be obtained from the main bulk of the solution by shaking a 10 c.c. portion with from 2 to 3 gm. of powdered sodium borate and allowing the solution to stand for a quarter of an hour. In the presence of aloes a green fluorescence appears. Another portion of 10 c.c. of the solution is heated with a drop of hydrogen peroxid and a drop of copper sulphate solution. A red coloration, becoming intensified on standing, indicates the presence of aloes. Emodin-bearing drugs which are free from aloes give an orange color, which does not alter on standing. It is claimed that 0.2 gm. of extract of aloes in the presence of 5 gm. of a mixture of extracts of rhubarb and cascara, etc., can be detected by this method.

On treating M. I. S. T. by this method satisfactory evidence of the presence of aloes was given. Controls were carried out by treating a mixture containing 15 drops each of the fluid extracts of cascara, rhubarb and senna and respectively 0.1 gm. of Soccatrine aloes, 0.250 gm. of Barbadoes aloes, and 0.50 gm. of Barbadoes aloes. The tests for aloes on the treated solution, after evaporation to small volume, were each negative. From this it would appear that the method is unreliable unless a considerable quantity of aloes be present.

Glycyrrhiza, Althea, etc.—The presence of these was ascertained by examination of the water-insoluble and alcohol-insoluble portions with the microscope.

Soap.—The contents of five capsules were dissolved so far as possible in cold water to which a trace of ammonia water had been added. The mixture was filtered, the filtrate acidified, the solution allowed to stand for some hours and filtered. The filter and insoluble residue were dried, extracted with ether and the solvent allowed to evaporate spontaneously. No fats on fatty acids were given. This was taken to indicate absence of soap in the preparation.

Mercury.—A weighed portion of the material was shaken with water until the masses were disintegrated, the mixture cautiously warmed in a Kjeldahl flask with a small amount of a mixture of five parts of nitric and one part of sulphuric acid until the mercury was dissolved and some of the organic matter had been destroyed. The mixture was filtered, the filtrate diluted with water, warmed, and saturated with hydrogen sulphid. The mercuric sulphid (together with some sulphur) was collected in a Gooch crucible, washed with water, the crucible and contents placed in a reflux apparatus, the mercuric sulphid dissolved in a little warm nitrohydrochloric acid, the solution boiled for thirty minutes, filtered, the filtrate saturated with hydrogen sulphid, the precipitate collected in a Gooch crucible, washed with water, then with alcohol and finally with carbon bisulphid. The washing with the last named reagent was carried out by placing the Gooch crucible in a small beaker, pouring the solvent on the precipitate and allowing the liquid to ooze through. The Gooch crucible and contents were dried at 100 C. to constant weight. The contents of ten capsules, weighing 3.2868 gm., were oxidized as above described and the solution diluted to 250 c.c. The mercuric sulphid from 100 c.c. of this solution, representing 1.3147 gm. of material, weighed 0.0646 gm., equivalent to 0.1391 gm. of mercury for the entire sample, or 4.24 per cent. A duplicate gave 0.0642 gm. of mercuric sulphid, equivalent to 0.1383 gm. of mercury for the entire sample, or 4.21 per cent.; average 4.22 per cent. of mercury.

NIKOLA

Nikola is a "bathing compound weight reducer," sold by the Nikola Chemical Company, New York City.

According to the advertisements, Nikola "takes fat off like magic," and we are assured "the results are immediate" and "twenty-one baths has been known to reduce eighteen pounds."

Nikola comes in cardboard boxes, 21 boxes constituting a "full cure." Each box contains 10 ounces of a coarse, white powder. The label on each box states:

> "Leading physicians recommend 'Nikola' as a positive weight-reducer and as a preventive of rheumatism, gout, kidney trouble and all forms of skin disease."

The directions call for dissolving one box of Nikola in a "full hot bath." The obese victim is to remain in the bath fifteen minutes or more and rub dry with rough towel.

The chemical examination showed that sodium carbonate, moisture and small amounts of chlorid were present. Quantitative estimations were as follows:

Sodium carbonate (anhydrous)	85.25 per cent.
Water	13.85 per cent.
Impurities (by difference)	0.90 per cent.
	100.00 per cent.

Thus we conclude that this "Bathing Compound Weight Reducer" is monohydrated sodium carbonate with a very small amount of sodium chlorid—probably commercial monohydrated sodium carbonate.

In other words, Nikola is essentially dried washing soda, with a trace of common salt!

Details of Analysis

Sodium Carbonate.—Of sample 5.6403 gm. were dissolved in water and diluted to 100 c.c. A. Of this solution 20 c.c. required for neutralization 18.90 c.c. of $N \times 0.960$ HCl, using methyl orange as indicator. This is equivalent to 82.23 per cent. Na_2CO_3. B. For 20 c.c., 18.90 c.c. of $N \times 0.960$ HCl, equivalent to 85.23 per cent. Na_2CO_3 were required. The theoretical amount of Na_2CO_3 in $Na_2CO_3 + H_2O$ (monohydrate) is 85.48.

Moisture.—(A) The loss from 2.1897 gm. was 0.3025 gm. at 140°. This is equivalent to 13.81 per cent moisture. (B) The loss from 1.8120 gm. of sample was 0.2521 gm. at 140°. This is equivalent to 13.91 per cent.

PLASMON, PLASMON POWDER AND PLASMON MILK POWDER

A physician wrote that, a consultant having prescribed "Plasmon" for digestive disturbance in a child, an order for

"Plasmon" was placed with a wholesaler, but "Plasmon Powder" was sent. The correspondent inquired whether "Plasmon" and "Plasmon Powder" were identical. Since The Journal's files did not contain sufficient information to warrant an authoritative reply and other inquiries concerning the composition of Plasmon having been received the matter was referred to the Chemical Laboratory.

There are several references to "Plasmon" in the literature, from which it appears probable that that preparation is made by dissolving precipitated milk-casein in a solution of sodium bicarbonate and evaporating the solution at a low temperature in an atmosphere of carbon dioxid. Reported analyses of "Plasmon" give from 8.5 per cent. to 10.66 per cent. of water, 70.51 per cent. to 75 per cent. of protein, 0.2 per cent. to 4.40 per cent. of fat, 4.20 per cent. to 8.9 per cent. of milk sugar and from 6.96 per cent. to 7.40 per cent. of ash.

An order for "Plasmon" without other qualification placed with a wholesale drug house in Chicago brought a preparation labeled "Plasmon Milk Powder." The package bore the statement: "Manufactured by Plasmon Milk Products Co., New York. Price, $1." A second order for "Plasmon" with the specification that "Plasmon Milk Powder" was not wanted brought "Plasmon Powder." This was labeled: "Manufactured for Plasmon Milk Products Co., New York. Price, 50 cents." The labels on the two products read almost exactly alike with the exception of the respective names of the preparation. A testimonial, claimed to have been given by Dr. Virchow, is printed on each package. The two testimonials are identical except that one is for Plasmon Powder and the other for Plasmon Milk Powder. The specimens examined resemble each other in many particulars. Plasmon Milk Powder is a pale yellow, granular powder resembling corn meal. It has a faint, pepsin-like odor and is practically tasteless. Plasmon Powder is a pale yellowish-white granular powder, slightly finer than Plasmon Milk Powder. Except in color it closely resembles the former. Neither of the products is soluble in water but each yields a turbid mixture if shaken with water.

Qualitative tests indicated the presence of protein substance, a sodium compound and small amounts each of fat and milk sugar. No medicinal substance was found. These two products were analyzed and the results, which are tabulated below, show that the two products are practically identical:

The examination indicates that Plasmon Powder and Plasmon Milk Powder probably are nothing more than crude milk casein rendered partially soluble by treatment with an alkali.

Comparison of the published analyses for "Plasmon" with those obtained for Plasmon Powder and for Plasmon Milk Powder shows that all three preparations are similar. For all practical purposes they are identical in composition. A similar preparation, Nutrose, is described in New and Nonofficial Remedies, 1915, p. 189.

	Plasmon Powder	Plasmon Milk Powder
Water (loss at 100 C.)	7.43	7.43
Ash	9.06	7.54
Phosphorus	1.24	1.25
Nitrogen	12.09	12.20
Protein (N × 6.38)	77.10	77.87
Sodium	2.68	2.01
Fat	0.38	0.19
Milk sugar	Undetermined	Undetermined

Details of Analysis

Loss on Drying.—This was determined by drying at 100 C. until the material ceased to lose weight. From 1.0006 gm. of Plasmon Powder a loss of 0.0745 gm. was found, equivalent to 7.45 per cent. From 1.0005 gm. of the material a loss of 0.0741 gm. was found, equivalent to 7.41 per cent. Average, 7.43 per cent. From 1.0092 gm. of Plasmon Milk Powder a loss of 0.0758 gm. was found, equivalent to 7.52 per cent. From 1.0021 gm. of the material, a loss of 0.0735 gm. was found, equivalent to 7.33 per cent. Average 7.43 per cent.

Ash.—Ash was determined by heating a portion of the material in a porcelain dish until charred, moistening the cooled residue with ammonium nitrate solution, drying and igniting to constant weight. In some cases it was found expedient to moisten the residue with ammonium nitrate solution a second time before final heating. From 1.0008 gm. of Plasmon Powder a residue of 0.0898 gm. was obtained, equivalent to 8.97 per cent. From 1.0013 gm. of material a residue of 0.0915 gm. was obtained, equivalent to 9.15 per cent. Average, 9.06 per cent. of ash. From 1.0014 gm. of Plasmon Milk Powder 0.0764 gm. of ash was obtained, equivalent to 7.63 per cent. From 1.0020 gm. of material 0.0747 gm. of ash was obtained, equivalent to 7.45 per cent. Average, 7.54 per cent. of ash.

Casein and Other Proteids.—The nitrogen in the product was determined by the Kjeldahl-Gunning method as described in "Official and Provisional Methods of Analysis" (Bur. Chem. Bull., 107, p. 7). The percentage of nitrogen was multiplied by the factor 6.38 to obtain the total protein. The distillate from 1.0058 gm. of Plasmon Powder required 8.765 c.c. of normal sulphuric acid, equivalent to 0.1221 gm. of nitrogen, or 12.14 per cent. The distillate from 1.0009 gm. of the material required 8.645 c.c. of normal sulphuric acid, equivalent to 0.1204 gm. of nitrogen, or 12.03 per cent. Average, 12.085 per cent. of nitrogen. This is equivalent to 77.1 per cent. of total protein. The distillate from 1.0007 gm. of Plasmon Milk Powder required 8.74 c.c. of normal sulphuric acid, equivalent to 0.1219 gm. of nitrogen, or 12.173 per cent. The distillate from 1.0049 gm. of the material required 8.828 c.c. of normal sulphuric acid, equivalent to 0.1230 gm. of nitrogen, or 12.237 per cent. Average, 12.205 per cent. of nitrogen. This is equivalent to 77.87 per cent. of protein.

Total Phosphorus.—Phosphorus was determined by the following method:

> About 5 gm. of the material were weighed into a Kjeldahl flask, 20 c.c. of a mixture of equal parts of nitric acid and sulphuric acid added, the mixture heated until oxidation was complete, a little more nitric acid being added with continued heating if necessary, the solution diluted with 50 c.c. of water, 5 gm. of ammonium nitrate added, followed by an excess of ammonium molybdate solution, the mixture warmed, shaken and allowed to stand on the water bath until precipitation was complete, the precipitate dissolved in a slight excess of ammonia water, the solution filtered, a slight excess of magnesia mixture solution added, the mixture stirred, allowed to stand for twelve hours, the precipitate collected in a tared Gooch crucible, washed with 1 per cent. ammonia water, dried, heated to low redness for fifteen minutes, cooled and weighed.

$$Mg_2P_2O_7 \times 0.27838 = P.$$

From 5.0018 gm. of Plasmon Powder 0.2237 gm. of magnesium pyrophosphate was obtained, equivalent to 0.0623 gm. of phosphorus, or 1.25 per cent. From 5.0002 gm. of the material 0.2218 gm. of magnesium pyrophosphate was obtained, equivalent to 0.0617 gm. of phosphorus, or 1.23 per cent. Average, 1.24 per cent. of phosphorus. From 5.0118 gm. of Plasmon Milk Powder 0.2260 gm. of magnesium pyrophosphate was obtained, equivalent to 0.0629 gm. of phosphorus, or 1.26 per cent. From 5.0001 gm. of material 0.2218 gm. of magnesium pyrophosphate was obtained, equivalent to 0.0617 gm. of phosphorus, or 1.24 per cent. Average, 1.25 per cent. of phosphorus.

Ether-Soluble.—This was determined by percolation with ether, evaporation of the solution and desiccation of the residue at 100° C. The ether-soluble part appeared for the most part to consist of fats. The residue from 9.9833 gm.

of Plasmon Powder weighed 0.0381 gm., or 0.38 per cent. The residue from 9.9695 gm. of Plasmon Milk Powder weighed 0.019 gm., or 0.19 per cent.

Because of the insignificant values found, duplicate determinations were not carried out.

Lactose.—Qualitative tests indicated that Plasmon Powder and Plasmon Milk Powder each contained traces of milk sugar. Because of the small amounts present no quantitative determinations were made.

Sodium.—This was determined by the following method:

> About 5 gm. of the material were ignited at low temperature until the mass was thoroughly charred, the cooled residue was moistened with ammonium nitrate solution, dried, again ignited and the cooled residue leached with water and the solution filtered. The insoluble residue was dried, ignited and the residue dissolved in water containing a few drops of nitric acid. The solution was filtered and the filtrate added to that obtained above. The united solution was evaporated to dryness in presence of a little nitric acid, the residue taken up in water, evaporated to small volume, diluted with water and a slight excess of a mixture of ammonia water and ammonium carbonate solution added. After standing for several hours the precipitate was removed by filtration, the filtrate evaporated to dryness and the residue heated to expel ammonium salts. The residue was taken up in water containing a few drops of nitric acid, the solution evaporated to dryness, this residue taken up in water, a fragment of barium carbonate and a slight excess of barium chlorid solution added and the mixture allowed to stand for some hours. The precipitate was removed by filtration, the filtrate warmed, a slight excess of diluted sulphuric acid added, and after some hours the precipitate of barium sulphate removed by filtration. The filtrate was evaporated, the residue heated until fumes ceased to be given off, the residue treated with ammonium carbonate in the usual way and weighed as sodium sulphate.

Plasmon Powder: From 2.0092 gm. of the material 0.1711 gm. of anhydrous sodium sulphate was obtained, equivalent to 0.0555 gm. of sodium, or 2.76 per cent. From 2.0074 gm. of the material 0.1604 gm. of anhydrous sodium sulphate was obtained, equivalent to 0.0520 gm. of sodium, or 2.59 per cent. Average, 2.68 per cent. of sodium.

Plasmon Milk Powder: From 1.002 gm. of the material 0.0681 gm. of sodium sulphate was obtained, equivalent to 0.0221 gm. of sodium, or 2.20 per cent. From 5.1602 gm. of the material 0.2905 gm. of sodium sulphate was obtained, equivalent to 0.0942 gm. of sodium, or 1.82 per cent. Average, 2.01 per cent. of sodium.

WORNER'S OIL LINIMENT

One bottle of Worner's Famous Oil Liniment (F. M. Worner, Phoenix, Ariz.) was received for examination. The label bore the following inscription:

> "For All Aches and Pains — For External Use Only — Shake Well Before Using."

The bottle contained a murky oil. On standing a sediment or turbidity would appear in the bottom of the bottle. From a qualitative examination it would appear that the liniment contained the following: oil of turpentine, camphor, menthol, sassafras and a considerable amount of a compound, not readily volatilized by steam, probably a liquid paraffin.

INDEX

PAGE

- Acid, boric, iodic, maizenic, etc.; see Boric acid, Iodic acid, Maizenic acid, etc.
- Alcohol, determination of in Iodia 58
  - determination of in Lower's Germen Prescription 53
  - determination of in PcDoLax 18
  - determination of in Warner's Safe Remedy 63
- Alkalinity, estimation of in theobromin sodium salicylate 9, 10, 11
- Alkaloids, mydriatic, alleged constituents of Henry's Tri-Iodides 66
- Aloes, detection of in M. I. S. T. No. 2 Nerve Tonic 86
  - in presence of phenolphthalein 22
- Ammonia in Thoxos 42
- Angier's Emulsion 55
- Angier's Throat Tablets 56, 57
- Anglo-American Pharmaceutical Company, Limited (Betul-ol) 74
- Anthracene purgatives 22
- Arsenic, determination of in Henry's Three Chlorides 69
- Bailey's method for detection of phenolphthalein in presence of rhubarb 23
- Ballard, J. F. (Tri-Iodides, Three Chlorides and Maizo-Lithium) 65
- Battle & Co. (Iodia) 58
- Berledite Company (Berledets) 78
- Betul-ol 74
- Bilious and Liver Tablets, Case's 32
- Bittersweet, name wrongly applied to Solanum tuberosum by Henry Pharmacal Company 66
- Boric acid in Berledets 78, 79
- Bornträger's reaction for emodin 19
- Caffein (thein), determination of in Elimiton 83
- Calamus, alleged presence of fluidextract of in Expurgo Anti-Diabetes 28, 30
- Caldwell's (Dr. W. B.) Syrup Pepsin and Herb Laxative Compound 80
- Cascara, in presence of phenolphthalein 22
  - bitterless, removal of, in presence of phenolphthalein 22
  - test for in Prunoids 64
- Case, Jesse A. (Case's Rheumatic Specific, Rheumatic and Gout Pills, Bilious and Liver Tablets) 30
- Casein, determination in Plasmon, etc 90
- Chlorid, determination of in Louisenbad Reduction Salt 36
- Chrysophanic acid 23
- Citrate, determination of in Maizo-Lithium 71
- Citrolax 45
- Citrolax Company of America 46
- Classen and Loeb's description of tetra-iodophenophthalein 21
- Cola, alleged presence of fluidextract of in Expurgo Anti-Diabetes 28, 30

PAGE
Colchicin, in Henry's Tri-Iodides 65, 66, 67
Condurango, fluidextract of alleged constituent of Expurgo Anti-Diabetes 28, 30
Curcuma, in presence of phenolphthalein 23, 24

Decandrin, alleged ingredient of Henry's Tri-Iodides 66
Diabetes nostrum (Expurgo or Sanol) 27
Diuretin 7
Dr. Jiroch Company (Dr. Jiroch "Proof Treatment") 53
Downs, Jean (Get Slim) 36
Duffy Malt Whiskey Company 60
Dunham's Specific for Whooping Cough 82

Elimiton (Hurwitt) 82
Emodin-bearing drugs, detection of in presence of phenolphthalein 19
Emulsion, breaking up of, in Angier's Emulsion 56
Every Woman Company (Every Woman's Flesh Reducer) 38
Expurgo Manufacturing Company (Expurgo Anti-Diabetes) 27

Fat Reducers 34, 36, 38, 78, 82, 87
Ferric chloride in Three Chlorides 68, 69
Foley & Co. (Citrolax) 46
Fougera, E. & Co. (Betul-ol) 74
  (Nourry Wine) 77

Gaultheria, constituent of Warner's Safe Remedy 61
Gentian, alleged presence of fluidextract of in Expurgo Anti-Diabetes 28, 30
German Prescription, Lower's 50
Get Slim 36
Ginger, detection of in Elimiton 83
Glycerine, determination of, in Warner's Safe Remedy 62, 63
Gout Pills, Case's 31

Haematoxylon, in presence of phenolphthalein 23, 24
Helonias, an asserted constituent of Iodia 58
Henry Pharmacal Company (Tri-Iodides, Three Chlorides and Maizo-Lithium) 65
Hepatica (herb) extract, constituent of Warner's Safe Remedy 61
Hexamethylenamin in Berledets 78, 79
  in Pyo-Atoxin 33
Hirsch's (J. M.) method of treating mercuric chlorid poisoning 39
Hurley, H. O. (Pyo-Atoxin) 33
Hurwitt, George J. (Elimiton) 82

Iodalia 75
Iodates, or iodic acid 67
Iodia 58
Iodic acid in Henry's Tri-Iodides 65, 66, 67
Iodid in Thoxos 42, 43
  determination of in Henry's Tri-Iodides 67
Iodin, determination of in Henry's Tri-Iodides 67
  determination of, in Iodalia 76
  determination of, in Iodia 59
  determination of, in Nourry Wine 77
  organic, determination of, in Elimiton 84

PAGE
Iodo-tannin compound in Iodalia.............................. 76
  compound in Nourry Wine.................................. 77
Ipecac, de-emetinized, test for, in Prunoids..................... 65
Iron in Henry's Three Chlorides............................68, 69
  in Tonsiline 44, 45

Jambul, alleged presence in Expurgo Anti-Diabetes.............28, 30
Jiroch, Dr. Company (Dr. Jiroch "Proof Treatment")............ 53

Knoll and Co. (Diuretin)...................................... 9
Kollo's method for determination of phenolphthalein............... 20

La Sage, Pearl (Pearl La Sage Complexion Treatment)........... 47
Lactose in Berledets.. 78
Landshut, Karl (Louisenbad Reduction Salt).................... 34
Leech, Paul N.: Theobromin sodium salicylate versus "diuretin"... 7
Lickes Drug Company (Dunham's Specific for Whooping Cough)... 82
Licorice, removal of in presence of phenolphthalein.............. 22
Liniment, Worner's Oil.. 93
Lithium, determination of, in Maizo-Lithium..................... 71
  determination of in Thoxos...............................42, 43
Liver Tablets, Case's... 32
Loeb and Classen's description of tetra-iodophenolphthalein........ 21
Louisenbad Reduction Salt..................................... 34
Lower, C. A. (Lower's Germen Prescription).................... 50
Lycopus Virginiana, asserted constituent of Warner's Safe Remedy. 61
Lyons, A. B., analysis of Iodia by.............................. 58

M. I. S. T. Company... 85
M. I. S. T. No. 2 Nerve Tonic................................. 84
McCoy's statement of the solubility of phenolphthalein............. 19
Magnesium, detection of in Elimiton............................ 83
  determination of in Louisenbad Reduction Salt.................. 36
Maizenate of lithium, alleged constituent of Maizo-Lithium......70, 71
Maizo-Lithium 65, 70
Mandragora autumnalis... 15
Mandrake, Biblical and American............................13, 15
Menispermum, asserted constituent of Iodia...................... 58
Menthol, determination of in Lower's Germen Prescription......51, 52
Mercuric chloride, in Henry's Three Chlorides................68, 69
  chloride poisoning, Hirsch antidote for........................ 39
Mercury, determination of in M. I. S. T. No. 2, Nerve Tonic...... 87
Methylene blue, detection of in Pyo-Atoxin...................... 33
Milk sugar in Berledets.. 78
Murray's Infallible System Tonic............................... 85

Nerve Tonic M. I. S. T. No. 2................................. 84
New York and Kentucky Company................................ 60
Nikola 87
Nourry Wine 77

Obesity "Cures"............................. 34, 36, 38, 78, 82, 87
Odor o no 25
Oleic acid in Betul-ol... 75

PAGE

Pearl La Sage Complexion Treatment.......... 47
Pepsin, absence of, in Caldwell's Syrup Pepsin and Herb Laxative Compound.......... 81
Pepsin Syrup Company (Caldwell's Syrup Pepsin and Herb Laxative Compound).......... 80
Perspiration preventive (Odor-o-no).......... 25
Petrolatum, extracted from Angier's Emulsion.......... 56
Phenolphthalein, determination of in Citrolax.......... 46
  determination of in Pearl La Sage Complexion Treatment.......... 50
  determination of in PoDoLax.......... 15
  determination of in Prunoids.......... 64
  in presence of aloes, 22; cascara, 22; curcuma, 23; haematoxylon, 23; licorice, 22; rhubarb, 22; senna, 22.
  removal of from solutions containing emodin-bearing drugs.......... 21
  solubility of.......... 19
Pheno-Methylene-Formate Hurley (Pyo-Atoxin).......... 33
Phenyl salicylate, determination of in Elimiton.......... 83
Phos-iron, asserted constituent of Iodia.......... 58
Phosphate, determination of in Berledets.......... 79
Phosphorus, determination of in Plasmon Powder and Plasmon Milk Powder.......... 91
Phytolaccin, alleged ingredient of Henry's Tri-iodides.......... 65
Plasmon Milk Products Company (Plasmon, Plasmon Powder and Plasmon Milk Powder).......... 88
PoDoLax.......... 12
Podophyllin, absence of in PoDoLax.......... 18
Podophyllum peltatum.......... 15
Poisoning, mercuric chlorid.......... 39
Poke-root (phytolacca) alleged constituent of Henry's Tri-Iodides.. 66
Potassium acid phosphate, constituent of in Berledets.......... 78
Potassium, determination of in Berledets.......... 79
  determination of in Louisenbad Reduction Salt.......... 35
  determination of, in Warner's Safe Remedy.......... 63
  in Tonsiline.......... 45
  iodid, determination of in Henry's Tri-Iodides.......... 67
  iodid, determination of, in Iodia.......... 59
  nitrate, constituent of Warner's Safe Remedy.......... 61
Potato, source of solanin, alleged constituent of Henry's Tri-Iodides 66
Protein, determination of in Plasmon Powder and Plasmon Milk Powder.......... 90
Prunoids.......... 63
Puckner, W. A.: Theobromin sodium salicylate versus "Diuretin".. 7
Purgatives, anthracene.......... 22
Pyo-Atoxin.......... 32
Pyoktanin, tests for, in Pyo-Atoxin.......... 34
Rheumatic Specific, Case's.......... 30
Rhubarb, determination of, in Elimiton.......... 83
  removal of in presence of phenolphthalein.......... 22
Rosemary, alleged presence in Expurgo Anti-Diabetes..........28, 30

Salicylate in Thoxos..........42, 43
Salicylic acid, determination of in Caldwell's Syrup Pepsin and Herb Laxative Compound.......... 82

PAGE
Sanol Manufacturing Company (Sanol Anti-Diabetes)............ 27
Saxifraga, asserted constituent of Iodia.......................... 58
Senna, detection of in Dr. W. B. Caldwell's Syrup Pepsin and Herb Laxative Compound.................................... 81
  detection of in PoDoLax..................................... 17
  removal of in presence of phenolphthalein..................... 22
Sodium borate, determination of in Pearl La Sage Complexion Treatment 49
  bicarbonate, solubility of, in sodium chlorid solution............ 41
  carbonate, determination of in Pearl La Sage Complexion Treatment 49
  carbonate, monohydrated, sold as fat reducer (Nikola).......... 88
  citrate, determination of in Maizo-Lithium........ ....71, 74
Sodium, determination of, in Louisenbad Reduction Salt......... 35
  determination of, in Plasmon Powder and Plasmon Milk Powder 92
  salicylate in Case's Rheumatic Specific......................... 31
  salicylate, in Expurgo Anti-Diabetes.........................28, 30
  salicylate, in Henry's Tri-Iodides........................65, 66, 68
Solanin, alleged constituent of Henry's Tri-Iodides............... 65
Solanum tuberosum, source of solanin, alleged constituent of Henry's Tri-Iodides... 66
Star anise, alleged presence of in Expurgo Anti-Diabetes........28, 30
Starch in Berledets..78, 80
Stillingia, asserted constituent of Iodia.......................... 58
Strontium, determination of in Thoxos.......................42, 43
Sugar, determination of in Berledets..........................78, 80
Sulphate, determination of in Louisenbad Reduction Salt.......... 36
Sultan Drug Company (Prunoids)................................ 63
Sutherland, E. E., Medicine Co. (PoDoLax)...................... 12
Syrup Pepsin and Herb Laxative Compound, Dr. W. B. Caldwell's. 80

Talcum, determination of, in Pearl La Sage Complexion Treatment. 50
Tetra-iodophenolphthalein 21
Thein (caffein) determination of, in Elimiton.................... 83
Theobromin, estimation of, in theobromin sodium salicylate........ 9
Theobromin sodium salicylate..................................... 7
Thoxos 41
Three Chlorides 65, 68
Tonsiline Company (Tonsiline).................................. 43
Tri-Iodides 65

Wallau, George J. (Iodalia)..................................... 75
Warner's Safe Remedies Company (Warner's Safe Remedy)...... 60
Warren, L. E.: Detection of emodin-bearing drugs in presence of phenolphthalein 19
  PoDoLax 12
Whooping Cough, Dunham's Specific for.......................... 82
Wintergreen, oil of, constituent of Warner's Safe Remedy......... 61
Worner, F. M. (Worner's Famous Oil Liniment).................. 93
Wyeth (John) and Brother (Thoxos)............................ 41

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